Original Communications

THE PRESENT STATUS OF THE TREATMENT OF CARCINOMA OF THE CERVIX UTERI*

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THE differences of opinion as to which method of treatment yields the best results in carcinoma of the cervix are more marked today than ever before. On the one hand are Stoeckel, Wagner, Peham, Jaschke and others who operate radically whenever possible and on the other hand the group composed of Doederlein, Menge, Seitz, Wintz, Regaud, Heyman and others who treat uterine carcinoma by radiation therapy only. Furthermore, of those who use surgery, a larger number operate by the vaginal route according to the Schauta technic and the remainder by the abdominal route after Wertheim; some in each group employ preoperative irradiation, some use postoperative irradiation prophylactically and some do not resort to radiation therapy at all. Lastly those who employ radiation therapy are divided into those who use radium, those who use x-ray and the group who combine both methods.

The methods of radiation therapy as employed by the various institutes and clinics are so completely at variance with one another that a fundamental comparison of the results obtained in the several institutions is practically impossible. This statement is concurred in by the radiologic division of the Cancer Commission of the League of Nations. And to this statement must also be added the fact that the ability to control the patient varies greatly; furthermore, as Stoeckel

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has said, there are many marked variations even between patients who have been classified as belonging to the same group. Indeed each author suggests in his own statistics that his individual results are the best and that if the absolute results reported do not bear out this fact, the blame lies not in the line of therapy or technic employed but rather in certain extraneous factors over which the author had no control. It is practically impossible, therefore, for even the most experienced clinician and critic to create for himself an accurate picture of the value of the different methods of treatment as reported in the literature.

Particularly difficult is the task of digging out the true final end-results from the mass of published statistics, all of which are more or less modified and influenced by varying local conditions. The very fact that there are so many variations in the statistical computations must prove that comparisons are practically impossible. This applies equally to a comparison of the results obtained by surgical and radiation therapy, due to the fact that all inoperable patients are referred directly to the radiation department rather than to the surgical division for therapy.

Many of the larger clinics now have departments of radiation therapy and it is therefore becoming easier to compare statistical reports, at least from such institutions. It must remain evident, however, that those clinicians who lean toward surgical therapy, will refer only the inoperable patients to the radiation department for treatment. And so even under these conditions comparisons are, for all practical purposes, impossible.

Until the introduction of radiotherapy, only surgery of the most radical type offered any chance of cure for uterine carcinoma. And since Sauter in 1821 performed the first total extirpation of the pelvic organs for carcinoma of the uterus, there have been devised many methods of radical surgery, vaginal as well as abdominal with this end in view. The best statistics, computed on cases treated surgically, show a clinical cure in from 40 to 50 per cent and an absolute permanent cure in 20 to 25 per cent. These figures are based on all carcinoma admissions and are uncorrected statistics. But the fact must not be lost sight of that these patients were operated upon in the larger clinics by the better trained gynecologists whereas the general results obtained by all practicing physicians must of necessity be much lower. They are lower because many who operate for carcinoma are not skilled gynecologists but general surgeons and practitioners who are for the most part untrained in this type of surgery. Carcinomatous residues in the parametrium are too frequently left behind and the surgery performed is too frequently incomplete to achieve a high percentage of cures. Even cervical amputation has been performed as a cure for carcinoma of the cervix. These facts and the fact that many

obsolete procedures are still being employed are deplorable both from
the gynecologic point of view and from that of the patient suffering
from carcinoma.

Radiation therapy offered a new method of treatment for carcinoma.
At first the results obtained were quite naturally no better than those
obtained surgically.   Here likewise a technic had to be developed and
various methods tried before useful results could be obtained.   It can-
not be denied that radiation therapy, like surgery, still shows inade-
quacy both as to methods and technic.   And further it must be em-
phasized and clearly understood that proficiency in radiation therapy
is more difficult to achieve than proficiency in surgery.   The surgical
treatment has for its purpose the wide excision and removal of all
diseased tissues.   It is performed directly under the eye and yet the
surgeons know the frequency with which surprises and disasters are
encountered.   Radiation treatment on the other hand deals in many
instances with the unknown.   It is often impossible to determine accu-
rately the extent of the carcinoma and of the tissues involved.   Espe-
cially is this true in the early cases.   Destruction of a deep lying car-
cinoma after deep radiation therapy can only be assumed, visual
control is never possible.   The method of radiation therapy to be
employed should be determined only on the basis of careful and exact
clinical follow-up examinations for each patient.   A routine method of
radiating all patients suffering from carcinoma is most inaccurate and
most undesirable.   Complications result even with the most carefully
worked out technic just as they do in surgery.   It is as difficult to
prevent injuries of the bladder, rectum and ureter by one method as
by the other.   In surgery, incomplete operations are decreasing in
frequency but the fear of producing possible injuries by too intense
radiation therapy still keeps many radiologists from employing ade-
quate dosages.   Complications with any new and involved procedure
such as radiation therapy are unavoidable even when competently
carried out.   They are, however, inexcusable when executed by un-
trained operators or with inadequate apparatus.

It is of course true that radiation statistics show the best results
obtainable to date because they are reported only from radiation insti-
tutes which have the best trained therapeutists for radiation therapy.
It must be conceded, therefore, that the average radiation results are
somewhat lower than those found in the literature.   The average
results obtained by irradiation must be lower than those reported only
by the best workers in the field.   Furthermore, radiation statistics are
subject to the same criticisms as are the surgical statistics.

TECHNIC OF IRRADIATION

The radiation therapy of uterine carcinoma must, of necessity, al-
ways be of the deep type.   It can be successful only if the apparatus is

mechanically equipped for this purpose and further if the roentgenologist is mentally equipped for carrying out the procedure. Radiation therapy can also be successfully carried out by the use of radium, with a minimal amount of 50 mg. of the radium element, although it is desirable to possess between 80 and 100 mg. Quantities of from 3 to 5 gm. such as Forsell, Regaud, DeNobile and Kelly have at their disposal must of necessity always remain exceptional amounts. But this fact is not of great moment, for these excessively large amounts which are used for percutaneous radiation can always be replaced by deep x-ray therapy. The use of such large amounts of radium means in reality the dissipation of large amounts of radiation energy. If the available radium in the world were to be collected and held in such large accumulations it would of necessity limit the number of cases which could receive its benefits. Excellent results are obtainable even with comparatively small amounts of radium when such small amounts are carefully and properly used. While it is true that the gamma rays emanating from radium are definitely harder than those which emanate from x-rays, it is a biologic fact that either type of gamma rays can be made to destroy the carcinoma cells or in fact any cells in the human organism.

The question has never been definitely settled as to whether or not there are carcinomas whose cells are resistant to x-rays and only susceptible to radium. This can perhaps be answered by careful animal experimentation. The superiority of radium irradiation has not been settled to date with any degree of certainty although many authors and workers make this claim. In those cases where radium has produced results following x-ray failure, such results have in all probability been due to a summation effect of the two types of irradiation rather than to the effects of the radium alone. The opposite experience, i.e., where radium had failed and good results were then obtained by the use of radium and x-ray, has also been reported. For example, Zimmerman reports the following case in *Strahlentherapie* (Vol. 29):

The patient had a carcinoma during pregnancy and following the second radium treatment the tumor disappeared completely. The patient then was delivered at term and during the puerperium a section was removed for microscopic examination, which showed the presence of a squamous cell carcinoma. The patient made a complete recovery and cure following a course of radium and x-ray therapy. She remained well and carcinoma-free for seven years.

One must conclude that the cure was here due to the combination of x-ray and radium after the latter, alone, had failed, or more properly that the cure was brought about by means of a summation effect of the two types of treatment. This case is an excellent illustration of the difficulties encountered in attempting to determine whether or not a given carcinoma is resistant to either x-ray or radium. This question can, as a matter of fact, never be definitely settled, until such

a time when a large tumor could be divided in half, the two halves carefully screened, and treating one-half with radium and the other half by x-ray. But even in such a test many sources of error would arise because of the difficulties of regulating the radium effect and the radium dosage. Furthermore, the indeterminable factor of secondary irradiation would enter into such an "ideal experiment" so that the one-half of the tumor would not have a pure irradiation from x-rays nor the other half a pure irradiation from the radium.

Radiation therapy is favored by the fact that the radium can be placed in the vagina and in the uterine cavity, frequently in direct contact with the tumor or even within its substance. For such procedures, 50 mg. of the element are sufficient for therapeutic results. An operator must work with small doses and small quantities of radium, due to the limited quantities of radium which are available in the world; and for percutaneous radiation, x-ray should be used rather than radium. In regard to its employment in general, it can be said that radium is used to better advantage in localized and small tumors of hollow viscera whereas x-ray can be used with better results and by easier application when the malignancy is spreading by flat extensions in solid tissues. Due to the anatomic conditions present in uterine carcinoma, either x-ray or radium may be used alone or in combination. The combined treatment will, in all probability, yield the best results.

Formerly the indications for treatment were simpler. It was possible to achieve permanent results only through radical surgery; today it is a free choice between surgery, radiation therapy, or surgery combined with irradiation. There are a number of surgical methods available, each with its distinct advantages and disadvantages. It cannot at present be stated which method lends itself best to preoperative irradiation and which to postoperative irradiation. These are new problems which must be studied statistically before arriving at any definite and final conclusions. Our experiences show that the introduction of radiation therapy has complicated rather than simplified the indications for treating carcinoma. For no one can say that radiation therapy has or ever will replace surgery by virtue of its superior results; this ideal goal will never be reached. One must always take into consideration the resistance to radiation which some types of malignancy exhibit, and especially the glandular varieties. The same holds true for carcinomas other than uterine, i.e., ovarian, tubal, gastrointestinal. Here irradiation likewise is of unquestionably definite value under certain conditions; nevertheless surgery with certain rare exceptions offers the only hope of permanent cure. The difficulty in arriving at definite conclusions concerning these problems is well illustrated in volume 29 of *Strahlentherapie* where two well-trained radiologists arrive at diametrically opposed conclusions about uterine car-

cinoma. Heyman of Stockholm describes his own excellent results in 500 cases of carcinoma which were subjected to primary radiation therapy. Bolaffia, formerly of Rome and now in Cagliari, strongly advises radical surgery and denounces preoperative irradiation for any operable cases. A definite answer has, therefore, not been found to the question of radical surgery versus radiation therapy in the treatment of carcinoma of the uterus.

There must be reasons for such diverse opinions as expressed by Heyman and Bolaffia. It is possible that the answer may be found in the type of therapy and in the dosages used. Then, too, northern races exhibit a greater resistance to carcinoma than do southern races; or it may be possible that the carcinomas as found in northern are more benign than those found among the southern races. It has been definitely shown that living conditions play a rôle in the course of carcinomatous patients. This has recently been reestablished at the London meeting of the British Society for the Control of Cancer in 1928 by Greenwood of London, M. Young of London and by Niceforo of Naples.

According to the latest investigations, living conditions would seem to be the determining factor for the studies of Shrewsbury. This author's work, made among the Jews of many countries of the world, disclosed the remarkable fact that the frequency of carcinoma among Jews in various countries varies greatly; further that this frequency is always the same as that of the carcinoma frequency of the country in general. And finally, the statement so frequently found in the literature that native races acquire carcinoma only after they have adopted the standards of living of civilized peoples, is evidence that the mode of living is responsible, together with certain unknown factors, for the appearance of carcinoma. Lastly, there appears to be no racial immunity against carcinoma.

To further explain the opposite end-results obtained by Heyman and Bolaffia, one must also consider the possibility that the type of patients in each report may have differed qualitatively. In the division of patients into operable and inoperable cases there are naturally many deciding factors. These are of course eliminated in the many operative cases which have undergone exploratory laparotomy for diagnostic purposes. It would be most desirable for the sake of comparison if one of the southern European clinics could, for a long period of time, adopt Heyman's technic which has produced such excellent results in the north of Europe. If all cases of uterine carcinoma could be treated by this technic it would then be possible to have an exact method of comparison. Perhaps the Section on Hygiene of the League of Nations might undertake such a problem. It is a lamentable fact that no two authors of the many who have reported the statistics of large series of cases, have ever used the same technic.

METHODS OF TREATMENT OF UTERINE CARCINOMA

There are then, at present, the following methods of treatment for carcinoma of the uterus:

I. Surgery

II. Irradiation
   1. Radium
   2. X-ray
   3. Radium plus x-ray.

III. Irradiation plus Surgery
   1. Surgery and postoperative prophylactic irradiation
   2. Preoperative irradiation followed by surgery
   3. Preoperative irradiation followed by surgery and postoperative irradiation.

And yet what happens most frequently? The patient is operated upon without any type of irradiation; and then, at some future date, when a recurrence of the malignancy is found, the patient is sent for radiation therapy instead of at least using postoperative irradiation prophylactically. Even when surgery is properly followed by irradiation, the latter is all too frequently valueless because of inadequate technic.

Radiation therapy should always have a definite place in the plan of treatment for uterine carcinoma. It is unnecessary here to discuss the technic of the various operations or the various methods of irradiation, since they are both well established and well known. It would seem desirable, however, to discuss the combination of surgery and irradiation. I believe that where surgery and postoperative irradiation are used, it is well-nigh impossible to say which produces the better results; certain it is that there is a definite improvement in the results obtained when the surgical procedure is associated with radiation therapy. This fact can be definitely proved by statistics notwithstanding an occasional opinion to the contrary, and we must reiterate our previous statement, namely, that cases must be irradiated. Let us then consider prophylactic postoperative irradiation, for which there is available a large number of statistical studies. Kroenig and Gauss have, since the early days of irradiation, been able to markedly improve their statistics by the routine use of postoperative irradiation. Warnekros, by means of carefully planned and systematic use of postoperative irradiation of all operated cases, has been able to improve his figures of relative cures from 35.7 per cent to 71.8 per cent; in other words he has doubled the number of relative cures. It must naturally follow that his incidence of permanent cures must also be markedly increased.

This so-called ''prophylactic'' postoperative irradiation was the first method by which surgery and irradiation were combined. Kroenig and Gauss were pioneers in this work. Reports similar to that of Warnekros were made by Zacherl and Lundwahl in 1923, by Adler in 1924, Breitschneider in 1924, Giesecke in 1923, Lehotsky-Semmelweiss in 1926 and by many others. Carcinomas of other organs were also treated by postoperative irradiation. Seitz and Wintz, Eymer, v. Franque, v. Jaschke, Strassmann, Schaefer, Breitschneider, Flatau, Aubert and E. Zweifel have all shown that there is a definite value in postoperative irradiation for carcinomas of other organs and all stress the importance of proper technic and dosage.

It should be recalled that postoperative irradiation had previously been abandoned for carcinoma of the breast because of the fact that the early statistics showed a decrease in the percentage of cures. Surgery alone seemed to yield better results. H. Meyer now reports that he has been able to double the number of cures by the proper use of postoperative irradiation. Buchholz (*Strahlentherapie*, vol. 29) also reports a doubling of the number of cures by the proper use of postoperative irradiation. His report includes 358 cases treated between 1906 and 1924 and is of value because of the large number of cases studied. His results are practically the same as those of H. Meyer in Kiel and are strikingly similar to those reported by Warnekros for uterine carcinoma. Buchholz used average dosages as recommended by H. Meyer and by Sgalitzer of Vienna.

We must explain the action of prophylactic postoperative irradiation on the basis that probably the carcinoma rests or the carcinomatous glands are disturbed in growth and function by the removal of the primary tumor or that the connective tissue is stimulated in its struggle with the carcinomatous tissue and that the growth of the residual tumor tissue is thereby hindered.

PREOPERATIVE IRRADIATION

Another method of combining irradiation and surgery is accomplished by means of preoperative irradiation and it was soon observed that some inoperable cases were converted into operable ones by this procedure. It is of no consequence whether rapidly decreasing infiltrations were carcinomatous or inflammatory, the fact remained that they disappeared and the cases became operable. Such cases where surgery followed irradiation soon increased in numbers and this method of preoperative irradiation and surgery soon developed many advocates such as Schmieden, Wintz, Heyman, Burman, Pfahler, Donaldson, Ganti, Oppert and Regaud.

A. Mayer and Walthard first used this method systematically for carcinoma of the uterus. A. Mayer worked out the preoperative irradiation on the following basis:

1. Radium irradiation sterilizes the carcinoma. The discharge decreases and often stops. The streptococci which were previously found, disappear and as a result the primary operative mortality is markedly decreased.

2. Von Schmieden found that all carcinoma cells become definitely inactivated by irradiation. The danger, therefore, of spreading the carcinoma or of leaving a local carcinomatous residue behind is decreased.

3. The patients improve when bleeding and discharge stop and come to the operating table in much better physical condition after irradiation.

The clinical improvement, the sterilization of the carcinomatous mass, the epithelialization of the tumor mass and the cessation of bleeding are acknowledged by all authors and have led to the use of radium as the method of choice for the palliative treatment of all inoperable cases. Another argument for preoperative irradiation is found in the investigations of Dehler who reports from the Erlanger Frauenklinik that "a change in the virulence of the streptococci found in carcinomas following irradiation is a constant finding: five to seven weeks elapse before the infection disappears following x-ray therapy; for radium therapy a somewhat shorter time is necessary." This statement fits in well with the clinical observations of A. Mayer, who was able to decrease the primary mortality due to peritonitis from 10.9 per cent to 4.4 per cent. Fuerst and others have reported similar results.

PREOPERATIVE IRRADIATION, SURGERY, POSTOPERATIVE IRRADIATION

Stoeckel reported his new routine of systematic and carefully worked out course of therapy for carcinoma of the uterus at the Gynecological Congress in Bonn in 1927. This treatment begins with preoperative radium therapy and is followed by radical surgery and finally by postoperative x-ray therapy. He chooses the vaginal method of radical extirpation and has modified it in the following manner:

1. Deep bilateral paravaginal incisions are first made (after Staude).

2. The tissues involved in the paravaginal incisions and in the cuff incisions are carefully infiltrated with adrenalin.

3. The ureters are carefully demonstrated and dissected free.

4. The removal of the parametrium and paracolpos is carried out as the last step in the operation and after the four main arteries have been carefully ligated.

5. The operation is preceded by radium therapy and followed by x-ray therapy.

The combined method of irradiation, surgery, and irradiation is as yet too new a procedure to be accurately and finally judged. It would seem, however, to very definitely add to simple postoperative irradiation from a practical as well as theoretical standpoint. The definite decrease in primary mortality would in itself be sufficient reason for the carrying out of this method. It remains to be seen whether this method will decrease the number of recurrences; theoretically at least, this may be expected.

It has in the past been reasoned that preoperative irradiation increases markedly, by virtue of its sclerosing effect, the difficulties of

the actual surgical procedure; that not only is excessive scar tissue produced but that the tissues all become more brittle and that hemostasis is, therefore, more difficult. Mikulicz in his latest report, however, makes no mention of such results; Stoeckel, in 1927, even went so far as to say that the radical surgery following irradiation is easier than without preoperative irradiation. We can at least say that in the Berlin clinic no undesired effects followed preoperative irradiation.

THE RESULTS OF TREATMENT OF CARCINOMA

I. Radical Operation by the Abdominal Route
    Relative Cures—
        Zweifel-Schweitzer   48.5 per cent
        Bumm-Franz   40.0 per cent
        Franz-Bracht   44.9 per cent
        Bauereisen   61.9 per cent
    Absolute Cures, Average   20.0 per cent

II. Radical Operation by the Vaginal Route
    Relative Cures—
        Schauta   38.0 per cent
        Peham   44.7 per cent
        Stoeckel   50.0 per cent
    Absolute Cures, Average   16-18 per cent

III. Irradiation Therapy
    Absolute Cures, Average   17.7 per cent (Stoeckel)

It will at once be apparent that no figures are quoted for relative cures by means of irradiation therapy. When one considers the variations in the definition of the term "operability," especially as to its frequency (Doederlein 15 per cent and Stoeckel 60 per cent), it must be evident that a comparison of relative cures through irradiation or surgery is no longer of any value. A comparison of the figures for absolute cures is not only possible but also of very definite value. Such a comparison shows surgery to be the more desirable method of therapy, the results by the abdominal route being 20 per cent, and by the vaginal route 17 per cent as against the results obtained by irradiation, 17 per cent. The difference is not, however, sufficient to rule out radiation therapy, especially when the factor of primary mortality is taken into consideration. Of all the published statistics on radiation therapy, only a very few can show better end-results than are obtained by radical abdominal surgery (Eymer 25 per cent, Heyman-Forsell 23 per cent, Kehrer 22.9 per cent and Ward 23.6 per cent). These results are approximately the same as the best published statistics for abdominal surgery.

ADVANTAGES OF IRRADIATION THERAPY

The great advantage which irradiation therapy possesses over radical surgery lies in the fact that with irradiation there is practically no primary mortality. Surgery has, on the other hand, a minimum pri-

mary mortality of from 5 to 10 per cent. This fact, well known as it is, has a far-reaching and diastrous effect in that it actually keeps patients away from the gynecologist. This unquestionably results in an increased mortality through delay. The laity, to a large extent, still believe cancer to be incurable. Such a conception must of course be changed and the public must be educated to the fact that not only is cancer curable but that the success of any type of therapy depends upon an early diagnosis.

In the treatment of inoperable carcinomas, irradiation therapy possesses marked advantages over any other type of treatment and even here, when all other methods have failed, it is possible to produce a certain percentage of absolute cures. This has been definitely proved by reports from Doederlein and others. Doederlein was able to produce absolute cures in 8 per cent of his inoperable cases, Heyman-Forsell in 13 per cent, and Regaud in 9 per cent and Wintz in 13 per cent.

All of the above discussion applies of course to carcinoma of the cervix uteri. Total vaginal extirpation cures a very large percentage of carcinomas of the corpus uteri, and the operation is a relatively safe one. The majority of gynecologists, therefore, use this method. For the inoperable cases, irradiation is, of course, indicated. Postoperative irradiation should, however, be used in every case as a prophylactic measure.

CONCLUSIONS

1. The methods of treatment for carcinoma of the cervix are:
     a. Surgery
     b. Irradiation
     c. Surgery plus irradiation.

2. Radical total extirpation can be carried out either vaginally or abdominally.

3. Either method can be combined with irradiation.

4. Irradiation therapy may be produced by means of x-ray, radium or both.

5. The absolute percentage of cures by
          a. Radical abdominal surgery is 20   per cent
          b. Radical vaginal surgery is   17   per cent
          c. Irradiation therapy only is   17.7 per cent.

6. Irradiation may be combined with surgery as preoperative, postoperative, or pre- and postoperative irradiation.

7. It is impossible, at present, to determine which procedure is the best.

8. The combination of irradiation and surgery produces better results than surgery alone.

9. Surgery should never, therefore, be performed without irradiation.

10. The greatest advantage which irradiation possesses is the fact that it is possible to cure a certain percentage of inoperable cases.

11. Irradiation has practically no primary mortality.

OBJECTIVES FOR THE FUTURE

The results obtained in the struggle against malignancy are, unfortunately, still very unsatisfactory; this is especially unfortunate in carcinoma of the cervix which can be diagnosed early and without much effort or skill. An improvement in the end-results of carcinoma of the cervix can be obtained by only a slight degree through an improvement in the technic. More marked results can be obtained by improving diagnostic methods. This is proved by the results of P. Zweifel who was able to report 87 per cent permanent cures in a series of carcinomas diagnosed early. Compared with these figures, an absolute cure of approximately 20 per cent is most unsatisfactory. If then women with early carcinomas can in the main be cured, it behooves us to educate women to apply for treatment early. Physicians as well as the laity must be educated and aroused to the necessity of early diagnosis and treatment. Women must be taught to present themselves for every irregular vaginal bleeding. Here lies the duty and function of the Committees on Cancer Control and Hygiene of the League of Nations. Funds must be donated and used for this purpose even as they are for the control of epidemics.

Dittel, L.: Psychotherapy in Gynecology. Wien. klin. Wchnschr. 42: 1478, 1929.

The author points out the psychic basis for many of the gynecologic complaints, laying special stress on those associated with coitus. In treatment of most of these complaints simple persuasion and suggestion are often sufficient. However, a knowledge of the various psychotherapeutic methods including analysis, Freud, Jung, Adler, hypnosis, etc., are highly desirable. The physician's personality, intuition, and assurance play an important rôle in obtaining results.

FRANK SPIELMAN.

REPORT OF RESULTS OF RADIUM TREATMENT OF CARCINOMA OF CERVIX

NINETY-TWO CASES TREATED FROM 1921 TO 1924, AT THE RHODE ISLAND HOSPITAL

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LATE in 1921 we received our supply of radium, and in the early months of 1923 the present clinic for the treatment of cancer, involving the female reproductive organs, was organized under the direction of the authors. The clinic met at first two afternoons each week throughout the year, for examination of patients referred for malignancy, or suspected malignancy, and for the reexamination of follow-up cases after treatment. All patients found to have malignant conditions were referred to the wards, and treated in the operating room under a general anesthetic, generally gas-oxygen. At the time of operation a biopsy was done on each case and the specimen sent to the pathologic laboratory, where it was examined by the pathologist and reported on. All of our cases, therefore, have a definite diagnosis based on microscopic examination of tissue removed. Unfortunately the slides up to 1925 have not been preserved, so that a review for the purpose of classifying as to the histologic grades of malignancy has not been possible in this series. For our later cases this will be possible, and we hope to report at some later time on this subject.

Our available radium for this series consisted of three 50 milligram tubes filtered by one-half millimeter of silver, and placed in a brass capsule 1 millimeter in thickness, and two 25 milligram tubes filtered in the same manner; also we had ten 5 milligram steel needles. The capsules were placed in the cervical canal usually two (2) 50 milligram tubes in tandem, contained in a piece of rubber tubing 4 millimeters thick. The remaining radium was placed against the cervix, being held in place by iodoform gauze packing. The steel needles were inserted about the periphery of the growth. Our plan at this time was to give between 3,500 and 5,000 mgh. of exposure, divided in two to three doses given at two to three weeks' intervals. We have since 1925 modified our treatment somewhat, and are now using, almost entirely, platinum filtered radium in the form of needles of 1 to 4 milligram content, which are thrust into the tissues about the cervix, placing them as near as possible to what we feel is the advancing edge of the growth. A platinum filtered capsule of 20 milligram content is placed in the

cervical canal. All the raidum is left in place six to seven days (144 to 168 hours). In this way we obtain a total of from 7,000 to 10,000 mgh. of gamma ray radiation, distributed in multiple small foci about and in the growth. We feel that our immediate results at least are much improved.

In our present reported series x-ray was not used except where we had to contend with extensive deep pelvic involvement. We have now begun to use deep x-ray routinely on all cases, and have recently been using it prior to radium, for a few selected cases where there was an extensive infected and necrotic growth.

For purposes of reviewing our cases we have drawn up three tables. Table I shows the number of cases seen each year, the number treated, and the number traced for a five-year period. The number alive at the

TABLE I

YEAR	NO. CASES	NO. TREATED	NO. TRACED	ALIVE					CURES PER CENT			
				1 YR.	2 YR.	3 YR.	4 YR.	5 YR.	3 YEARS ABS	TRACED	5 YEARS ABS	TRACED
1921	8	8	6	6	2	0	0	0	0	0	0	0
1922	22	22	20	14	11	9	6	5	40.0	45.0	22.7	25.0
1923	32	31	32	10	8	6	5	5	18.7	18.7	15.6	15.6
1924	30	29	30	17	10	6	6	6	20.0	20.0	20.0	20.0
Total	92	90	88	48	31	21	17	16	22.8	23.6	17.4	18.2

Immediate mortality two cases, 2:90 or 2.2 per cent.

end of each year is then shown, and in the last two columns the three- and five-year cures in percentage figures. Two sets of figures are given, ABS, the absolute, calculated on the basis of all cases seen or examined; and Traced, based only on cases actually traced and known to be alive. Total figures for the four years are recorded at the foot of each column. It is evident that there is considerable difference between the three- and five-year figures. Many cases which were alive and, as far as clinical examination showed, free of disease at the three-year period, died later, generally from extensions starting in the deep pelvic lymphatics, which must have been present as small foci at the time of the original treatment. The problem of dealing with these pelvic glands is the most difficult one we have, and we freely confess it is as yet not solved. Deep x-ray has held, and will hold these involvements in check for a time, but does not cure, and eventually the disease wins out. We have in numerous instances opened the abdomen from above and planted needles or radon implants directly into the nodules, and in some instances apparently controlled the disease for a short interval. This method does not give permanent results, and there is certainly an added risk and mortality to be considered.

In Table II, the cases are tabulated as to age groups.

TABLE II

AGE	CASES	TRACED	CLINICAL GROUP				ALIVE					ABS CURE PER CENT	TRACED CURE PER CENT	OPER-ABILITY PER CENT
			I	II	III	IV	1 YR.	2 YR.	3 YR.	4 YR.	5 YR.			
20-29	4	3	1	1	1	1	3	2	2	1	1	25.0	33.3	50.0
30-39	19	18	0	5	7	7	10	5	4	3	3	15.8	16.6	26.3
40-49	27	27	1	4	10	12	16	10	9	8	8	29.6	29.6	18.5
50-59	25	25	1	5	9	10	13	10	4	3	3	12.0	12.0	24.0
60-69	8	7	0	0	3	5	3	2	1	1	1	12.5	14.2	0
70-79	7	6	0	1	4	2	2	1	0	0	0	0	0	14.3
80-	2	2	0	0	1	1	1	1	1	0	0	0	0	0
Total	92	88	3	16	35	38	48	31	21	16	16	17.4	18.2	20.6

The age groups have been subdivided into clinical groups (defined in connection with next Table III), and in addition to the cure rates, the operability for each group is given, the operability per cent consisting of the ratio between Group I and II cases and the total. As might be expected the greatest number of cases fall in the fifth and sixth decades; in this series about an equal number in each. It is interesting to note that the percentage of five-year cures in the fifth decade group is quite markedly higher in spite of a lower operability rate, than either the preceding or succeeding decade. That the percentage of five-year cures should fall off rapidly in the seventh and eighth decades is to be expected, as the general life expectancy in these groups is of course much shorter. It would seem then that, in this series at least, patients between forty and fifty years old had the best prognosis for five-year cures.

TABLE III

GROUP	NO.	TREATED	TRACED	LOST	ALIVE					ABS CURE PER CENT	TRACED CURE	COMBINED CURED PER CENT	
					1 YR.	2 YR.	3 YR.	4 YR.	5 YR.			1 & 2	1, 2 & 3
I	3	3	3	0	3	3	3	3	3	100.0	100.0		
II	16	16	14	2	16	13	10	8	8	50.0	57.0	57.9	27.7
III	35	35	34	2	18	10	7	5	4	11.4	11.7		
IV	38	36	37	0	11	5	1	1	1	2.5	2.5		
Total	92	90	88	4	48	31	21	17	16	17.4	18.2		

In Table III, the cases are divided into four clinical groups, based on the degree of clinical advancement of the disease. Of course, there is in this division a certain personal element, and there must always be a certain variation among operators as to what constitutes especially a Group II or Group III case. We classify as Group I, only cases in which the disease is definitely limited to less than one-half of one lip of the cervix. Group I cases are, therefore, relatively rare, 3:92; obviously this group should be most favorable because we can entirely surround it with radium, and completely cross-fire it. The three Group I cases are alive and well for the five-year period reported. Group II

cases are those where more than half of the cervix is involved, and where there may be a little superficial extension to the vaults, but where the uterus and cervix are still freely movable, that is, the cervix can be brought down with a tenaculum within normal limits. There is no fixation, and there is no thickening in the parametrial tissues, or evidence of involvement of the deep pelvic glands, as palpated per rectum. Not infrequently we find a fairly good sized cauliflower growth, which falls under this class. In our Group II cases our problem is more difficult, but yet we cured one-half of our cases for the five-year period.

Group III cases are those in which in addition to a more extensive cervical and vaginal involvement, there is definite fixation and thickening of the parametrium, with probable, but not always palpable, deep pelvic glands. Here we almost always obtain a good primary result. Cervix and vault heal over with disappearance of bleeding and discharge, and improvement in general health lasts from several months to five or six years. The outlook for a permanent cure is very doubtful, however, because we have no way of getting beyond the growth which is almost invariably present in the outlying glands, and as I have already stated, we do not know how to eradicate the cancer in these glands. We have only four out of 35 cases which have survived the five-year interval.

Group IV cases are those where the general involvement of the pelvic tissues is so great that only palliation is possible. Only 11 of this group survived the first year and five the second year. One case was followed for the five-year period, and when last seen by Dr. Pitts was alive and apparently free of disease. She has since been lost trace of. Whether she should have been classified as Group IV is a question. It sometimes is difficult to differentiate between an inflammatory reaction in the broad ligament and a true cancerous invasion. We certainly do not expect our Group IV cases to survive five years as the result of the methods of treatment now at our disposal. In the last column, the combined results for Groups I and II are shown to be 57.9 per cent; if we compute only on the basis of cases traced, 64 per cent. For Groups I, II, and III, that is, all but the hopelessly advanced cases, the cures amount to 27.7 per cent; and for the traced cases in these groups to 30 per cent. In this classification into four groups according to the clinical stage of the disease, we have followed more or less closely the classification laid down by Schmitz.[3] We feel that the defined stages can be fairly accurately determined and that over a large series there will be the least amount of variation due to the personal factor. We prefer it to the less clearly defined "operable-borderline-advanced" classification.

In Table IV are shown the results obtained in several different clinics, in treatment of cancer of the cervix. The results from surgery are first given as determined by the excellent work of Heyman of the

TABLE IV

CLINIC REPORTING	CASES REPORTED	5 YR. CURES	OPERABLE	5 YR. CURES	OPER-ABILITY
		PER CENT		PER CENT	PER CENT
Operative Statistics[1]	5806	19.1	3659	35.6	54.6
Radiologic Statistics					
Radium Hemmet 1914-1923[1]	790	20.6	180	40.4	25.5
17 Clinics Combined, Heyman[1]	3512	16.3	960	34.9	25.6
Woman's Hospital, G.G. Ward[2]	134	23.1	32	53.5	23.8
Mayo Clinic, Bowing-Fricke[5]	1094	21.8	9	66.6	0.8
Schmitz-Hueper[3]	332	17.5	71	53.5	21.9
Rhode Island Hospital	92	17.4	19	57.9	20.6

Radium Hemmet who collected his statistics from twenty operative clinics.

While our number of cases is perhaps small in comparison to others, we feel that our results are creditable, and hope that our next figures may show some improvement.

In conclusion we must join the ranks of others, and draw the lesson that at present our best chance in treating cancer of the cervix successfully lies in the early recognition of the disease. When we get the cases still in the Group I and II stage, our results are very good, and the prognosis is very favorable; we can approach our problem with justified confidence. When the patient comes late or with definite fixation, we must be extremely guarded in our prognosis of more than a temporary betterment of the condition.

In regard to the reporting of series of cases, we feel as others do, that there should be some uniform method of classifying cases, and reporting of results, whereby the figures of different clinics could be compared. Where one clinic reports 25.6 per cent operable cases, and another only 0.8 per cent it is quite obvious that different standards are in force. We believe that advancement in method of treatment can come only through further clinical experimentation; that each clinic should develop its own ideas and technic, but that all should conform to a like standard in describing and reporting results. In this way only, progress can be made.

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THE ROENTGEN RAY AS AN ADJUNCT IN OBSTETRIC DIAGNOSIS*

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THIS study was undertaken with the object of reviewing and evaluating the use of the roentgen ray in obstetrics in general and more particularly in abnormal conditions during pregnancy. A great deal of excellent work has been done in this field yet I believe that radiography is insufficiently employed in obstetric and gynecologic diagnosis. To contribute our experiences and results and to stimulate those of you who teach and practice obstetrics to make more use of this very important adjunct is my only excuse for presenting "just another paper" on this subject.

That the science of roentgenology enters into and cannot be disassociated from the practice of internal medicine and surgery is a universally accepted fact. That it should be the same in the practice of obstetrics and gynecology is conceded but not generally practiced. The difficulty, up to now, undoubtedly has been due largely to inadequate equipment, fear of injury to the fetus and general ignorance of the value of roentgenology in obstetrics. However, the time is not far distant, if indeed, it is not now upon us, when roentgenology and obstetrics and gynecology must be more intimately associated. This can and will be done provided the roentgenologist and obstetrician work together harmoniously. This will not be difficult for the roentgenologist is always, both by instinct and training, cooperative and consequently there should be no difficulty in developing the proper "teamwork." The obstetrician must take the lead and exhibit the proper amount of enthusiasm, for certainly the roentgenologist cannot be expected to know when roentgenography is indicated in a given obstetric case. It would seem therefore that the future of this very important help in better diagnosis is entirely in the hands of the obstetrician. Do not misunderstand and think for a moment that the x-ray can or should supplant any of our methods of obstetric diagnosis. It should be looked upon only as an adjunct.

In view of our present-day knowledge, the roentgenologist and the obstetrician who understand their problems may proceed without fear of doing harm to the fetus, regardless of the stage of its development. Meticulous care in the exposure at any one sitting is most important. It has been estimated that the usual amount of radiation involved in

the making of a film of the pregnant uterus is equal to $\frac{1}{50}$ of an erythema dose. (Hickey.) Another method of estimating a safe amount of exposure has been figured out for me by Dr. A. L. L. Bell, Radiologist at the Long Island College Hospital and is as follows: with 88 K.V., 30 M. A. and 1 mm. aluminum filter it takes only 23.5 seconds to give the same depth dosage as is obtained with 118 K.V., 3 M. A., and 3 mm. aluminum filter in 2 minutes. We know that the standard for maximum exposure is that amount of radiation which will produce biologic effects. It is also known that 25 radio units (international) will produce such changes in the ovary of the adult. A 23.5 seconds exposure, using 5 inch gap, 30 M. A. and 1 mm. aluminum filter at 10 inch skin distance results in a depth dose of 25 radio units, therefore to be reasonably certain that no biologic effects are produced on the fetus in utero this "dose" should be cut at least in half and preferably more. This means that on the basis of one-half of this "dose" and assuming a 3 second exposure, only three or four films at one sitting could be safely made. Furthermore the effects of x-radiation on tissue in general is exhausted in about three weeks and hence we feel safe in exposing the fetus in utero several times during a given pregnancy, provided the time is properly spaced. With this evidence at hand it at once becomes apparent that such "dosage" is absolutely safe as far as danger to the fetus is concerned. Several investigators, including Warnekros of Dresden, have taken numerous consecutive roentgenograms (18 exposures) of the mechanism of labor, more particularly during the actual delivery, and have noted no ill effects upon the child. I cannot think of a single instance where more than 4 to 6 roentgenograms need be taken during a given pregnancy and certainly this number is within safe limits.

We have taken roentgenograms of 306 pregnant women, a few of which have been radiographed from 4 to 6 times, the average being 2, totaling over 600 films, and we have not seen any abnormalities in the children attributable to the x-rays. Many of the children have been followed up for five years in the pediatric clinic at the Long Island College Hospital and the Methodist Episcopal Hospital and in private practice. Those skeptics who are continually crying out against the diagnostic use of the x-ray in obstetrics should remember these facts. Furthermore, they should remember that all of the proved cases of fetal malformations attributable to irradiation have been in those cases treated with therapeutic doses of x-ray or radium for certain pathologic lesions (uterine bleeding, fibroids, cancer, etc.) and naturally such cases should not be confounded with the type under consideration. We feel sure that no pregnancy, regardless of its stage of development, is damaged by diagnostic roentgenology properly carried out.

Professor Roentgen discovered the x-ray in 1895. In reviewing the literature since that time one finds that the roentgen rays, although rather sporadically, have been used as an adjunct in obstetric diagnosis. Why such a valuable addition to our diagnostic armamentarium has not been more universally used by the obstetrician, as it has been by the surgeon and internist, is difficult to explain. It may be said, however, that obstetrics, during the past twenty-five years, has not made the same outstanding and far-reaching advances as an art that medicine and surgery have. Furthermore, be it remembered that, twenty-five years ago and even today in certain communities throughout our country, almost any person may practice "so-called obstetrics"; whereas to practice surgery one must have had some special training, or at least served an apprenticeship under a qualified surgeon, before "going out on his own." When the public demands this of their obstetricians then the science and the art of obstetrics will have the recognition it well deserves. When this "comes to pass," and it will in a few more years, obstetric diagnosis will be placed on a higher plane and hence every available adjunct will be used for arriving at a proper diagnosis. We shall be doing pelvimetry and cepholometry after the method of Thoms or some modification of this method; diagnosing doubtful pregnancy; and finally when there is the slightest doubt regarding multiple pregnancy, the possible existence of fetal abnormality, faulty or doubtful presentation and position, death of the fetus or pseudocyesis, we shall make a positive diagnosis by means of the roentgen ray. The surgeon has made the x-ray an integral part of his diagnostic equipment and could not possibly continue his work without it. Today a surgeon could not expect to win a suit for malpractice, for example, if he had not employed the x-ray in making a correct diagnosis and carrying out the proper treatment. Tomorrow the obstetrician is likely to find himself in much the same position.

While the work to be presented in this paper does not include pelvimetry and fetal cephalometry, I think it most important and regret that we have been unable to do much with this phase of the subject. We expect to make a report, however, on this work some time in the future. The pelvic inlet can be measured by the x-ray, although up to now the methods in vogue have been so complicated that the average roentgenologist could not, or for the lack of time and proper cooperation, would not assist the obstetrician in carrying out the scheme. At present, however, with the less complicated method of Thoms, this procedure can be carried out without undue labor and loss of time. Furthermore, Thoms' method of measuring the important diameters of the fetal head in utero seems far more simple and practical than any other method heretofore proposed and bids fair to become of inestimable value to the obstetrician. Neither of these meth-

ods need be carried out routinely but in certain doubtful cases much of the guesswork of former years can be eliminated by the use of them singly or in combination.

For the past five years we have been using the roentgen ray in all our obstetric cases where there was any doubt as to the correct diagnosis. In the beginning our technic was faulty and hence we failed many times in obtaining a readable skiagram of the fetus in utero or perhaps of a given maternal pelvic deformity. Persistence, on the part of both the roentgenologist and the obstetrician, developed a better technic and hence a better photographic plate. It is only by such "team work" that this kind of diagnostic work can be carried on with success. Our endeavors have been limited to the diagnosis of the various uncertain conditions associated with the pregnant state.

The conditions in obstetrics for which the x-ray may be used as an adjunct in diagnosis are the following:

Group I.—Those relating to the maternal pelvis: (1) deformed pelves (all varieties); (2) pelvis measurements, especially the superior strait; (3) bony or calcified tumors of or in the pelvis; (4) separation of the pubic symphysis; (5) amount of healing after pubiotomy.

Group II.—Those relating to extrauterine pregnancy: (1) tubal pregnancy; (2) abdominal pregnancy.

Group III.—Those relating to intrauterine pregnancy: (1) diagnosis of pregnancy before other characteristic signs and symptoms appear—pneumoperitoneum method of Peterson—not so important now as we have the Zondek-Aschheim test which is positive in 98 per cent of the cases; (3) early diagnosis of pregnancy from the fourteenth to the twentieth week when for one reason or another a positive diagnosis cannot be made; (3) multiple pregnancy—twins, triplets, etc.; (4) presentation and position of fetus; (5) cephalometry; (6) death of the fetus; (7) monsters, anencephalus, hydrocephalus, double monsters, etc.; (8) spina bifida and other defects in the fetal skeleton; (9) syphilis of fetal bones; (10) hydatidiform mole (by exclusion); (11) fractures of the fetal bones and skull; (12) osteogenesis imperfecta; (13) illegitimate pregnancies where no examination can be made; (14) for the diagnosis of pregnancy, presentation, and position in very large fat women, 200 to 300 pounds; (15) before cesarean section to determine if the child is normally formed.

Group IV.—Those relating to pelvic tumors simulating pregnancy: (1) fibroid tumors of the uterus and pregnancy at or beyond the sixteenth week; (2) myomata uteri simulating pregnancy; (3) ovarian cysts, particularly dermoids.

Group V.—Miscellaneous conditions: (1) spontaneous version; (2) pseudocyesis; (3) mechanism of labor; (4) mode and method of separation of placenta (Warnekros); (5) lithopedian; (6) location of placenta; (7) proof of extrauterine life (Vogt).

Of the conditions enumerated in the preceding paragraphs, those in which we actually used the x-ray to complete or make more positive the diagnosis were the following: (1) early pregnancy fourteen to twenty weeks; (2) multiple pregnancy; (3) presentation and position; (4) hydatidiform mole (made by exclusion); (5) monsters especially anen-

cephalus; (6) fetal death; (7) spina bifida (cervical); (8) pregnancy, presentation, and position and abnormalities in very large fat women (one over 260 pounds); (9) previous to cesarean section to determine if the child is normal; (10) fibroids complicating possible pregnancy; (11) ovarian cysts mistaken for pregnancy; (12) abdominal pregnancy; (13) deformed pelves, without pelvimetry. In every one of these conditions there was some doubt about the correctness of the diagnosis as made by the usual methods in such cases (viz.: history, physical examination, laboratory data and clinical course). This seems
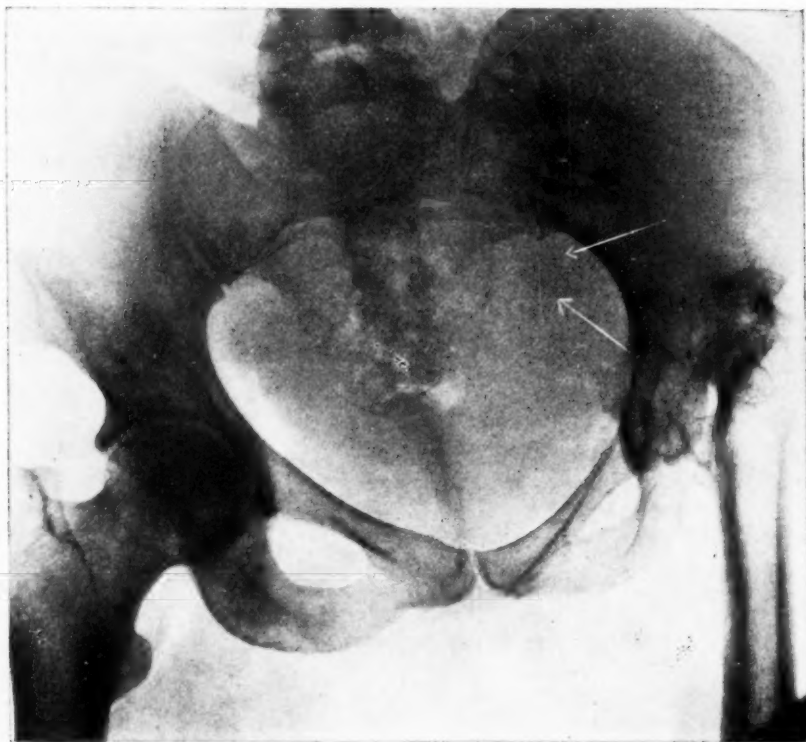
Fig. 1.—Mrs. F., No. 235. X-ray taken to ascertain type of deformity of pelvis. Obliquity due to ankylosis of left hip and adduction of thigh. Left oblique less than right oblique. Also shows early pregnancy of about fifteen weeks, which can be distinctly seen on the original x-ray plate at points indicated by arrows.

to me to be well worth while and highly desirable in any obstetric clinic, private or public.

The main factors which mitigate against positive roentgenograms, especially during the early months of pregnancy, are the thickness of the mother's abdominal and uterine walls; respiratory movements of the mother; the liquor amnii, which is radio-opaque; insufficient density of embryonic bones; later in pregnancy, the circulating blood in the uterus and placenta, which Bartholomew (1921) estimated absorbs about 60 per cent of the rays; and finally movements of the fetus

which blur or duplicate the film and thereby cast some doubt as to the true diagnosis. Because of the presence of these conditions the roentgenologist who wishes to succeed must devote considerable time and meticulous care in taking each film. Such work cannot be delegated to a technician unless well trained in the filming of the abdomen and pelvis during pregnancy. The Potter-Bucky diaphragm is of course absolutely essential and the best superspeed films obtainable are very important adjuncts in securing good roentgenograms.

TECHNIC[1]

Posturing (arranging the patient in the best position) is very essential although not as difficult as other items in technic because it is more controllable. Motion, such as respiration of the mother, is often difficult to control but patience brings its reward. We always take two films, one anteroposterior and one lateral exposure, because diagnostic phases not included in one position will usually be noted in the other and therefore a more correct opinion may be rendered. The following table gives the technic in detail:

All exposures to be taken on Bucky diaphragm.
Tube, 30 M. A., radiator type.
Film, duplitized safety contrast films, used with double screen (Eastman).
Anteroposterior and lateral exposures.
Measurements taken through the greatest diameter of the abdomen and expressed in inches. Lateral exposures are measured separately, and machine setting changed accordingly.
Gap is measured by the point gap method and read in inches.
Time factor is variable, particularly in the higher measurements.
Dark room technic, standard.

Size	Gap	M. A.	Time
6"	3 "	30	4 sec.
7"	3½"	30	4 "
8"	4 "	30	4 "
9"	4½"	30	6 "
10"	5 "	30	8 "
12"	5 "	30	12 "
14"	5 "	30	12 "

In the diagnosis of early pregnancy (fourteen to twenty weeks), before the usual signs and symptoms permit of a positive diagnosis, the x-ray is of inestimable value. By its use we were able to make a positive diagnosis from fourteen to fifteen weeks in 15 per cent of our questionable cases, from sixteen to eighteen weeks in 75 per cent and from the eighteenth week to term in 100 per cent.

For example, a widow, forty-four years old with amenorrhea of six months' duration and who had had a diagnosis of a large soft fibroid tumor of the uterus, consulted Dr. G. H. Davis, a member of our staff, who thought she was pregnant, although the fetal heart could not be heard and no fetal movements had been felt by the patient. Since the woman had been a widow for eleven years she became highly indignant at the diagnosis of probable pregnancy, vehemently denying exposure. A roentgenogram revealed fetal bones indicating early pregnancy of about fourteen

[1]Outline of technic contributed by Dr. Geo. W. Cramp, Roentgenologist of the Methodist Episcopal Hospital of Brooklyn.

of fifteen weeks' duration. The woman then admitted exposure three and one-half months previous to the date of her visit to the doctor's office. Some weeks later she reported to her physician that she had had an abortion performed and was "well and happy."

Again a young primipara (Fig. 1) who had an ankylosed left hip resulting from an old suppurating condition, the nature of which she did not know, consulted her physician because she thought herself pregnant. According to the date of her marriage and last menstrual period she should not have been more than fourteen weeks pregnant. Upon examination she was found to be about three and one-half months
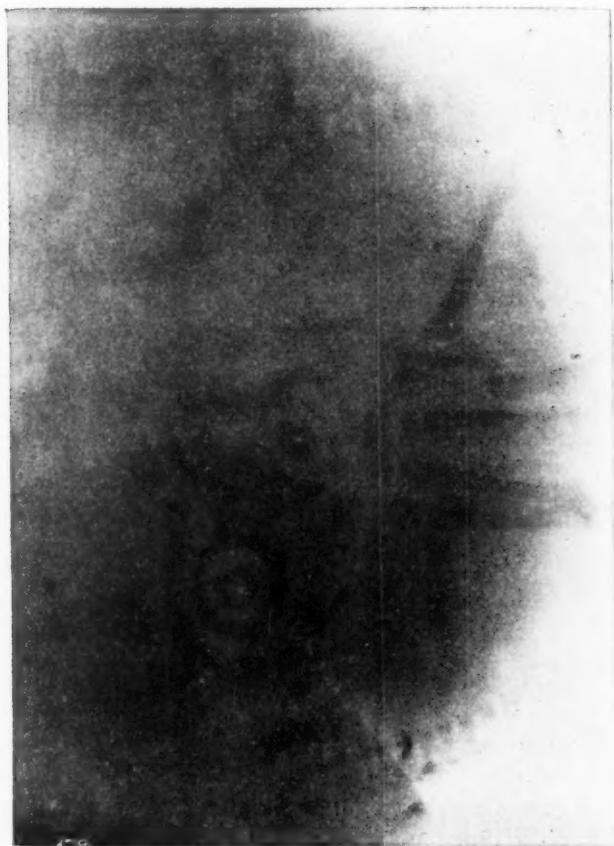
Fig. 2.—No. 3796, Mrs. T. Suspected twins, only one fetal heart heard. Roentgeno-gram in lateral position required to show twins.

pregnant. The question of her delivery then came up for consideration. A skia-gram was taken of the pelvis and fortunately we obtained the desired information regarding the bony pelvis, fetal bones, proving the positive existence of early pregnancy.

These two cases are the earliest films of a fetal skeleton that we have obtained, the pregnancy being not more than fourteen to fifteen weeks' duration, and unless we can improve our present-day equipment and technic, I do not believe it is possible to obtain a readable

skiagram earlier than fourteen weeks and only a small percentage at this age. We took 18 roentgenograms of early pregnancy cases from the prenatal clinic at the Methodist Episcopal Hospital and private cases from eight to fourteen weeks, and in only 3 did we get a readable skiagram and these were from fourteen to fifteen weeks' duration.
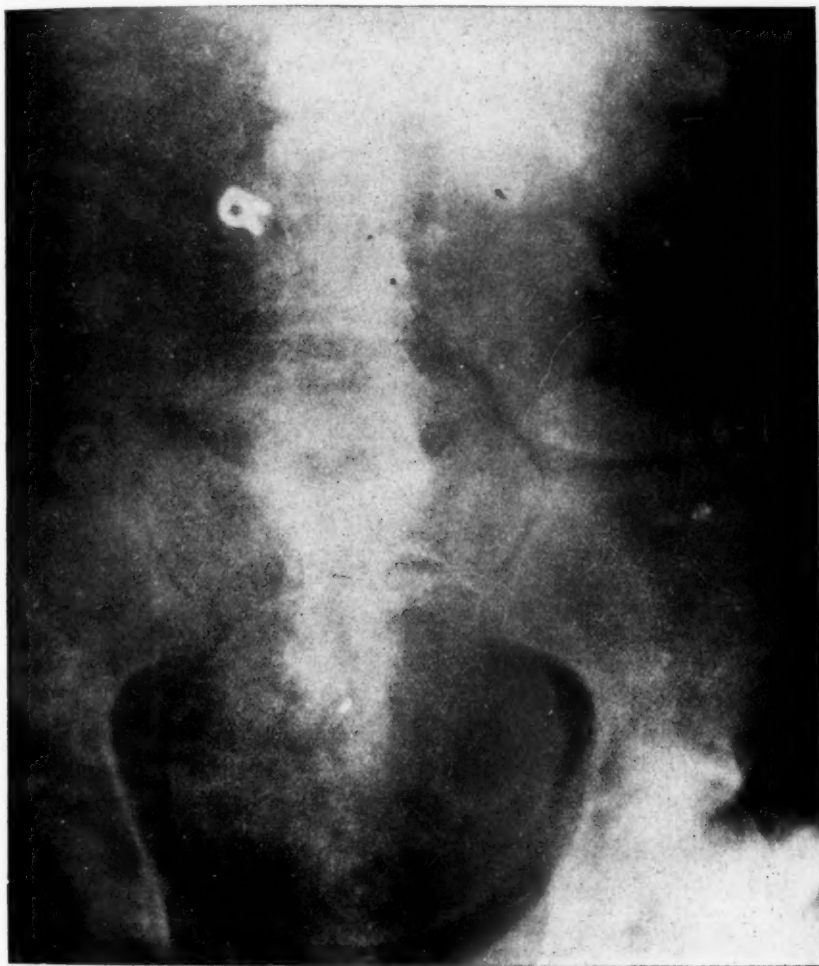

Fig. 3.—Mrs. G. B., x-ray diagnosis of triplets at seven months; delivered at eight and one-half months, all born alive.

In all other conditions associated with the pregnant state in which we employed the roentgen ray as an aid in diagnosis we found it most informative, either positively or negatively. It was probably employed more times for the diagnosis of multiple pregnancy than for any other condition (Figs. 2, 3, 4, and 5). For this it was always positive, since the question of multiple pregnancy does not usually come up for final decision until rather late in the pregnancy. In the

diagnosis of presentation and position one does not need the x-ray very often. Still we used it a number of times for the positive diagnosis of breech and occiput posterior positions particularly in very large fat women. Recently we used the x-ray to make a positive diag-
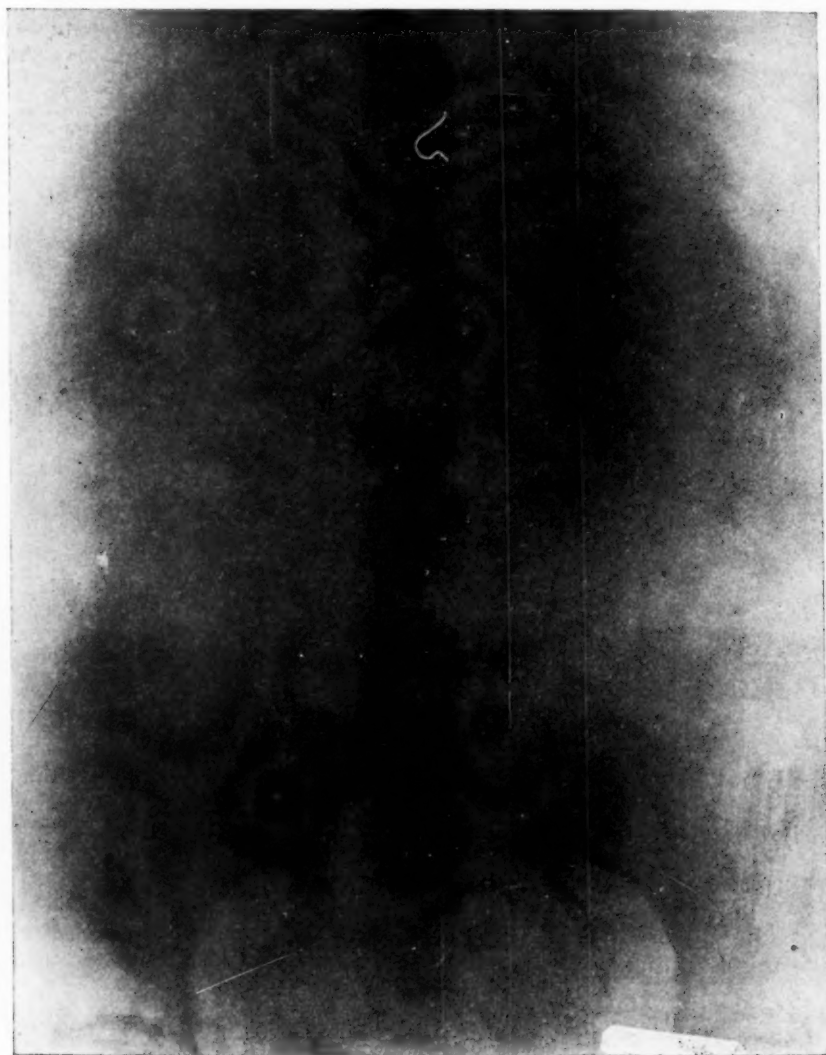
Figs. 4 and 5.—Mrs. M. G., No. 299. Twin pregnancy, showing value of routine anteroposterior and lateral exposures. Anterior film (Fig. 4) shows merely a head in the pelvis but the lateral film (Fig. 5) shows the other head in the upper abdomen.

nosis of pregnancy as against hydatidiform mole in the following case: a young duo-para was thought to have an hydatidiform mole. She gave a history of pregnancy of about five months' duration and many of the characteristic signs of vesicular mole were present, in-

cluding a vaginal discharge which had persisted for two months (dark and bloody, and sometimes bloody serous) but more recently there had been little if any discharge. There was no doubt about the diagnosis

Fig. 5.

when the skiagram showed a fetal skeleton with positive signs of fetal death. Labor was induced and she was delivered of a dead fetus followed by a large amount of bloody liquor amnii and clots, which

undoubtedly accounted for the uterus measuring seven months in height while the history and roentgenograms indicated only about five months' pregnancy.
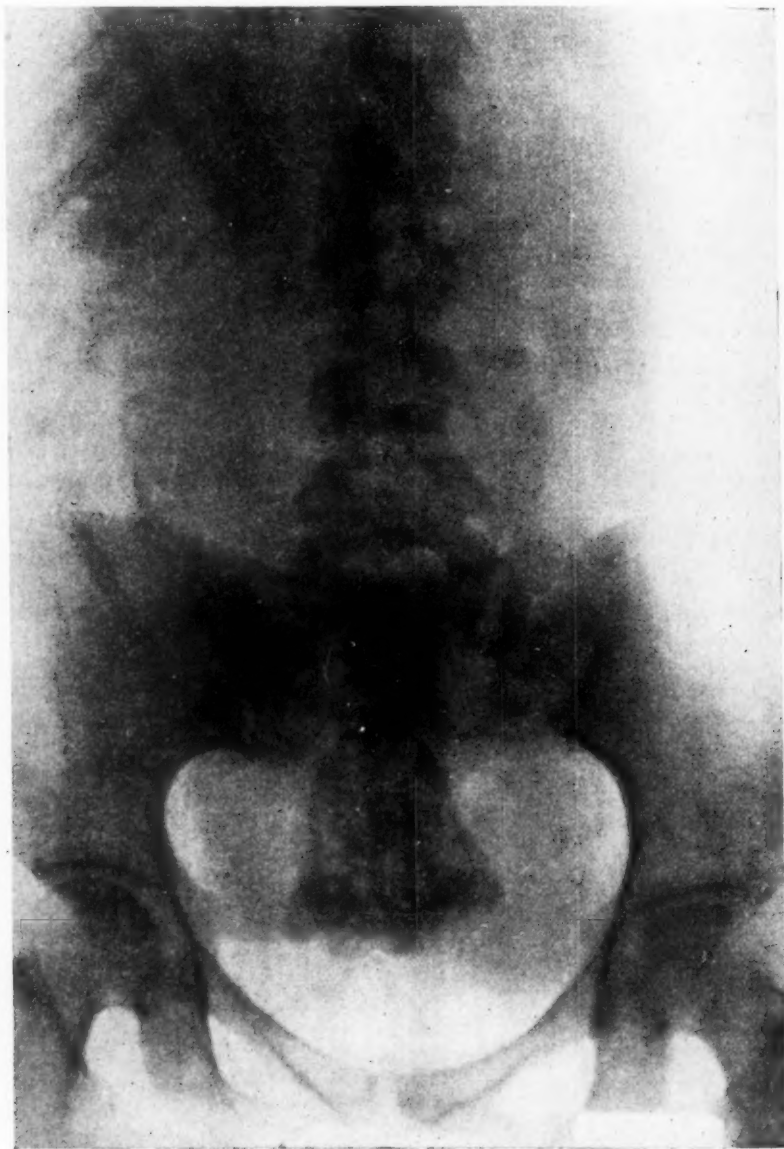

Fig. 6.—Mrs. A. K., No. 218. Anencephalic monster, full term.   Moderate poly-hydramnios. Note outline of the feet.

In our series the diagnosis of anencephalic monster was made five times before delivery was accomplished, thereby enabling the obstetrician to fortify himself againse criticism by informing the family

(never the patient!) of the presence of a fetal monster.   (Fig. 6.)   I
have personal knowledge of a case of hydrocephalus of such marked
degree that the upper abdomen was markedly distended whereas the
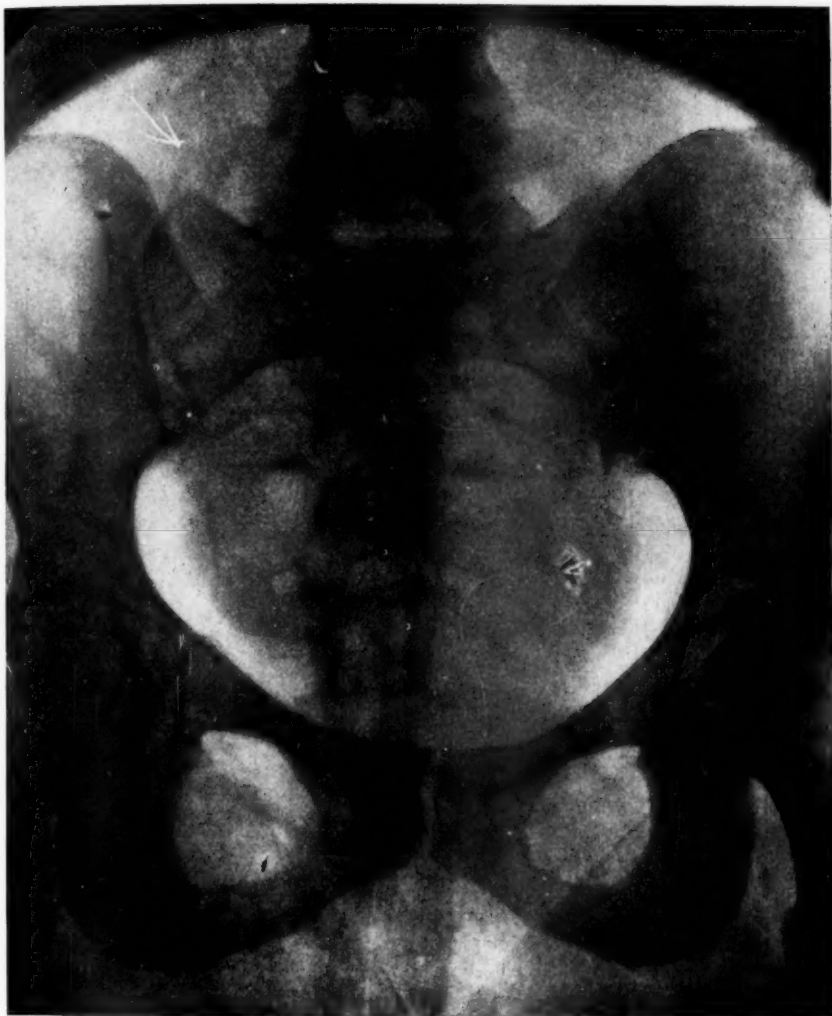presenting breech did not unduly distend the lower abdomen.   While

Fig. 7.—(A. P.), Mrs. P., No. 50343. Clinical diagnosis of fibroids, operation advised by surgeon. X-ray showed a complicating pregnancy about sixteen weeks duration. Delivered of normal child, 8 pounds. Aug. 20, 1928.

the obstetrician might not have suspected hydrocephalus, he should
have suspected that some abnormality of the fetus was likely.   At any
rate, without a roentgenogram, cesarean section was done and a huge
hydrocephalic monster was removed which fortunately died in a few
days.   Another instance where the x-ray would have saved the obstetri-

cian much criticism is illustrated by the following: a young, wealthy society woman, pregnant for the first time, at full term, had been in labor some twelve to fourteen hours without satisfactory progress.

Fig. 8.—Lateral view of Fig. 7. Arrow points to fetal femur.

After a careful vaginal examination and a final survey of the case it was decided to perform cesarean section. This was done and an anencephalic monster was delivered which died in a few minutes. There was considerable consternation and criticism from the family.

A skiagram before the operation would have made a correct diagnosis, the family could have been informed of the true state of affairs before the delivery and cesarean section need not have been performed. The mother was very ill following the operation but finally fully recovered.

Today the surgeon or gynecologist who removes a fibroid uterus that contains a four or five months' pregnancy may well feel chagrined and indeed not be surprised if suit is instituted against him for malpractice. The Zondek-Aschheim test will give positive information in 95 per cent of the early pregnancies while if the pregnancy is be-
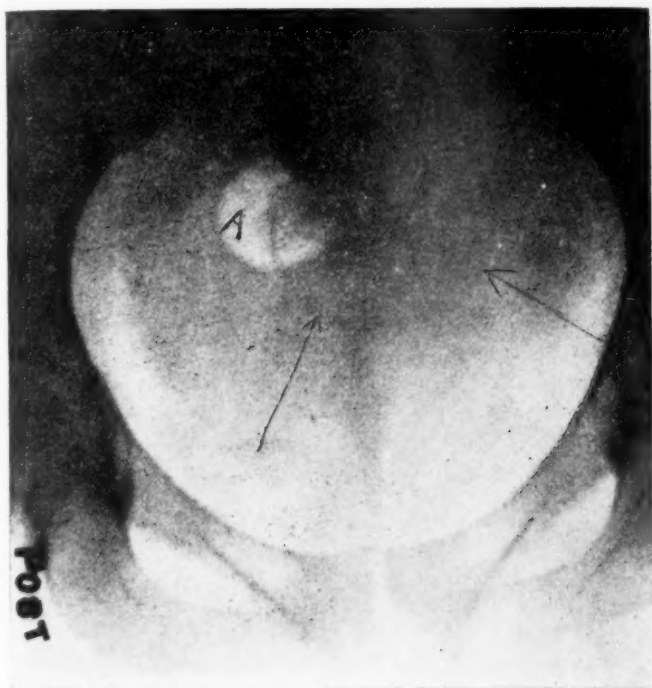

Fig. 9.—Mrs. M. S., No. 69027. Question of pregnancy associated with fibroids of uterus. A calcified fibroid. Roentgenogram also revealed early pregnancy (sixteen to eighteen weeks).

tween the sixteenth to eighteenth week the x-ray will give positive evidence in 85 per cent and beyond the eighteenth week 100 per cent of the cases. In our series we made a positive diagnosis of pregnancy in the presence of fibroid five times (all fifteen to eighteen weeks) and eliminated pregnancy in one where the fibroid tumor was somewhat softened and nodular and about the size of a five months' pregnancy. From the history we did not feel that the patient was pregnant, but from the pelvic examination there was a suspicion of pregnancy due to the softness and compressibility of the uterine mass. A skiagram was taken and reported negative for pregnancy.

This case came to hysterectomy and the ablated uterus did not contain a fetus. Now while I am fully aware of the fact that we might have missed the presence of fetal bones by the roentgenogram in this case, nevertheless a negative roentgenogram added considerable more evidence to the fact that pregnancy did not exist. An instance where the x-ray saved a pregnancy that was very much desired is illustrated by the following case: a thirty year old nulliparous woman, who had been married five years and was anxious to have a child, consulted a well-known surgeon because of an amenorrhea of four months' duration and gradual enlargement of the abdomen. The surgeon diagnosed

Fig. 10.—A. S., No. 77439. Question of ovarian cyst or thin-walled pregnant uterus. Roentgenogram demonstrated presence of pregnancy. (Sixteen weeks.)

fibroids and recommended operation. The patient refused this advice and went to another better known surgeon who recommended the same operation that the first surgeon had offered and again she refused. She thought she might possibly be pregnant and since she was very desirous of a child, she again consulted her faithful and sympathetic family physician who referred the case to us. Examination revealed a nodular fibroid uterus, rather soft in spots, and about the size of a five or six months' pregnancy. No fetal heart could be heard and no life had been felt by the mother. A roentgenogram revealed an early pregnancy and she was delivered Aug. 20, 1928, which made her not

more than sixteen weeks' pregnant at the time the roentgenograms (6 in number) were taken. (Figs. 7, 8.) The child is alive and well today and needless to say the family is highly elated. She has not yet been operated upon for her fibroids. This one case should "sell" the x-ray to every obstetrician and gynecologist. (Fig. 9.)

Another most interesting case in which the x-ray cleared up an uncertain diagnosis was the following: a young woman twenty-five

Fig. 11.—Mrs. M. B., No. 5164. Eight and one-half months pregnant. Examined in prenatal clinic May 9, 1930. Fetal heart O. K. Fetal movement present. Admitted to Methodist Episcopal Hospital May 12, 1930, fetal heart not heard, no fetal movements for two days. Roentgenogram showed distinct overlapping of skull bones and bowing of spine. Stillbirth two days later. Diagnosis of fetal death made by the roentgenologist between forty-eighty and seventy-two hours after fetus died. Earliest case in our records.

years old, a "cub" reporter on the staff of a large New York newspaper, was referred to me with a diagnosis of ovarian cyst, for operation. Upon examination I found what I thought was a very thin walled pregnant uterus but no fetal heart could be heard. The pregnant uterus felt very much like an ovarian cyst. However, I informed

the young lady that she was pregnant. She had previously been rather evasive in her history and now became quite abusive because of the diagnosis of pregnancy. To allay the young lady's anger and to fortify myself against possible error, I advised her to go immediately for an x-ray. A roentgenogram showed the fetal bones of an early pregnancy (about sixteen weeks). (Fig. 10.) Faced with positive evidence of pregnancy, she promptly admitted having been exposed.

Fig. 12.—Mrs. F. Abdominal pregnancy. Fetus high up under ribs on right side. A long bone just below right iliac crest with faint outline of small uterus in right side of pelvis, sufficiently strong to suspect abdominal pregnancy with history and physical findings. Positive diagnosis was made from the film. Operation and delivery of a live child.

There is no method by which the death of the fetus in utero can be positively and quickly determined except by the roentgen ray. For this reason we became much interested in the x-ray diagnosis of fetal death because there are many times, particularly in consultation practice, where this positive information is highly desirable both by the patient and the physician. The never-failing skiagram characteristics

of dead fetus in utero are: (1) overlapping of the cranial bones
(Spaulding's sign); (2) asymmetry of the fetal head with wrinkling
of the scalp, which cannot always be seen on the film but if seen is

Fig. 13.—Mrs. R. B., No. 1008. Breech presentation. Head high, giving distortion
in anteroposterior position; might be mistaken for hydrocephalus unless lateral view
is taken. Child normal at birth.

corroborative evidence of fetal death; (3) collapsed appearance of the
"thoracic cage"; (4) angulation or bowing of the vertebral column
("horse-shoe spine"). Practically every roentgenogram of intra-

uterine fetal death gives the first two signs enumerated above within a few days and if the child has been dead two weeks or longer all four signs are invariably present. We have had occasion to x-ray 17 cases of suspected intrauterine death, in cases where no fetal motion had been felt by the mother for several days or weeks and no fetal heart heard by the physician. All of these cases proved to be dead on deliv-

Fig. 14.—Mrs. B. S., No. 4061. Question of twins, large abdomen only one fetal heart heard. Roentgenogram revealed one child. Fetus moved, giving the impression of two heads. Demonstrates need of meticulous care in reading films.

ery. Spaulding's sign is pathognomonic and appears very soon after the death of the fetus, in one of our cases between two and three days. The mother had felt no fetal movements, the obstetrician could hear no fetal heart sounds, and the x-ray revealed overlapping of skull bones. Naturally Spaulding's sign would be of no value in a case in labor with the head engaged. The other signs, which follow Spaul-

ding's sign fairly rapidly (ten to fourteen days), are just as charac-
teristic of fetal death, but as they appear later, it seems fair to say
that overlapping of the skull bones is the earliest sure sign of fetal
death. I might add before leaving this subject, that the fourth sign
of fetal death in utero (''horse-shoe spine'' or bowing of the vertebral
column) is one that I have not seen mentioned in the literature but
one which we have found to be constantly present after ten to fifteen
days and of very positive diagnostic value. (Fig. 11.)

The incidence of cesarean section is obviously on the increase and
while the morbidity and mortality is considerably less than it was
ten years ago there is still room for improvement in certain communi-
ties. It is good obstetrics to perform cesarean section when indicated
and if the baby is alive and normal there is no operation more satis-
factory. Notwithstanding the importance of the child, many of the
most careful obstetricians do not use the roentgen ray before cesarean
section to determine whether or not the child is normal. This point I
wish to emphasize, viz., every candidate for cesarean section should have
a roentgenogram before operation. While we have not, for obvious
reasons, routinely practiced this in our clinics, we do have a roentgeno-
gram of every case that shows the slightest deviation from the normal
and as many others as is consistent with good judgment.

In the very large obese women, with thick pendulous abdomen, the
x-ray offers positive evidence of pregnancy, oftentimes before the ob-
stetrician can make a diagnosis by the usual methods. Furthermore,
the diagnosis of suspected abdominal pregnancy, as illustrated by Fig.
12, can be positively made by a good skiagram of the abdomen.

Regarding the abnormal pelves, considerable information can be ob-
tained if one has had sufficient experience, by the use of the roentgeno-
gram. There are, of course, many chances for error and since the Thoms'
method of pelvimetry is exact and practical it would seem that this
method should displace the less accurate one of ''comparative measure-
ments with the eye.'' (Figs. 13 and 14.)

CONCLUSIONS

1. A positive roentgenogram of the fetal skeleton is proof of the
existence of pregnancy. This may be added as a fourth positive sign
of pregnancy and may be obtained as early as the fourteenth to
fifteenth week in 15 per cent of cases, at sixteen to eighteen weeks in
75 per cent and beyond the eighteenth week 100 per cent of the cases.

2. A positive diagnosis of normal and abnormal pregnancy, includ-
ing many types of fetal abnormalities, can be made by the roentgen
ray, provided the pregnancy is at or beyond the eighteenth week.
The farther advanced the pregnancy the more positive the diagnosis.

3. A positive diagnosis of fetal death can be made by roentgen ray, apparently within three or four days after death, provided the pregnancy is at or beyond the sixteenth week.

4. A positive diagnosis of pregnancy complicating fibroids of the uterus can be made by the roentgen ray, provided the duration of the pregnancy is sixteen weeks or more.

5. A positive differential diagnosis between pregnancy and other pelvic tumors (soft myoma, ovarian cysts, etc.) can be made by the roentgen ray, provided the pregnancy is at or beyond the sixteenth week.

6. The filming "dosage" herein recommended is perfectly safe for the fetus.

7. Every patient who is a candidate for cesarean section should have a roentgenogram taken to determine the normalcy of the child.

8. A positive roentgenogram may be offered in court cases as proof that pregnancy exists.

9. Finally, it is highly desirable that the obstetrician cooper e with the roentgenologist and thereby help to further develop, simplify and popularize a very important adjunct in obstetric diagnosis.

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DYSMENORRHEA OF ENDOCRINE ORIGIN RESPONDING SATISFACTORILY TO MEDICAL THERAPEUTIC MEASURES

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THE lack of knowledge concerning the pathologic physiology of the functional dysmenorrheas and the lack of sufficient therapeutic measures at our command make their treatment indeed a perplexing problem.

This essay is prompted by both the failure of most writers to mention a type of functional dysmenorrhea responding satisfactorily to medical therapeutic measures and the desire to increase the armamentarium of the physician to recognize and treat this dysmenorrhea in that it often frequents his practice unrecognized. It is symptomatic of a more or less constant clinico-pathologic entity, "interstitial thyrotoxicosis" which is a pluriglandular affection associated with secondary thyroid manifestations and when the thyroid dysfunction is treated in the conventional manner, the dysmenorrhea disappears and satisfaction is voiced in the vast proportion of cases. For this reason it is called "goiterous dysmenorrhea."

From whence came the term "interstitial thyrotoxicosis"? Two observers independently recognized and described a certain type of goiter associated with a mildly chronic hyperthyroidism; Goetsch[1] designated it "diffuse adenomatosis" to demonstrate the idea that it was primarily a goiterous affliction and Hertzler[2] called it "interstitial goiter" in the sense that it was a pluriglandular compound in which the thyroid manifestations were secondary. At a later date, the latter[3] established its intimate relationship to dysmenorrhea and termed the clinical picture "interstitial thyrotoxicosis."

The fact that dysmenorrhea is only a symptom, and not a definite clinical entity, necessitates a description of the endocrine disturbance with which goiterous dysmenorrhea is associated.

INTERSTITIAL THYROTOXICOSIS

Symptomatology.—After once it is recognized, the symptom complex is fairly characteristic. Most of the cases occur in the female between the ages of sixteen and thirty years, there being, however, no age limit. These patients can usually antedate the onset of their trouble.

The outstanding clinical features are the mild chronic hyperthyroidism, nervous instability, pelvic dysfunction including pains in the right lower quadrant of the abdomen so commonly diagnosed "chronic appendicitis," and an underdeveloped skeletal build and genital tract.

Pains in the right lower quadrant of the abdomen, so frequently diagnosed "chronic appendicitis" in women afflicted with this endocrine disturbance, have been proved time and again to the satisfaction of this clinic to be symptomatic of ovarian dysfunction. In as far as the existence of the mythical "chronic appendicitis" is concerned, it is impossible to conceive how the processes of fibrosis in repair and advancing age can cause the symptoms that warrant its designation; furthermore, the end-results of appendectomy for its relief are more than convincing that too many innocent appendices are mislabeled.

There are two forms of interstitial thyrotoxicosis as recognized by Hertzler, namely, the true and pseudotypes. That which differentiates them is the skeletal build and the response to medical therapeutic measures. The true type has a physique that indicates maldevelopment, while the pseudotype occurs in well-developed girls and adults of normal constitution who shortly after treatment or marriage become normal individuals.

Chronic Hyperthyroidism.—The systemic manifestations of hyperthyroidism are mild and chronic. Occasionally when associated with metabolic disturbance, there is seldom seen the loss of weight in the thyrotoxicoses. The basal metabolic reading is normal and well within the percentage of error. The pulse rate seldom exceeds 120 per minute. The blood pressure is lowered. With the least exertion there is tachycardia, palpitation and shortness of breath. The tachycardia is more apparent during the forenoon. These patients are always tired, morose during the early hours of the forenoon, in fact they arise tired. Eye signs are never present. Tremors that are either fine or coarse are seen in the abducted and extended fingers. There are slight elevations in temperature that make one suspect a tuberculous process somewhere in the body. The white blood cell count hovers around what may be considered beginning leucopenia. The Goetsch test is invariably positive and never is the reaction like that of goiterous disease.

The palpatory findings of the goiter responsible for the associated thyroid dysfunction are best preceded by what is to be considered characteristic of an apparently normal functioning thyroid. Cabot states that the normal functioning thyroid is not palpable. He is correct with one exception that the gland in slim-necked individuals at the age of puberty and adolescence is easily palpable. Palpation is often deceiving as to actual size in that a large gland in short-necked and obese individuals may be just palpable. The consistency of the

palpable normal thyroid is never any more than soft and elastic. Its approach to firmness predicates toxicity and to actual hardness either malignancy or inflammation.

The interstitial goiter is somewhat uniformly enlarged though not always perfectly symmetrical. Its consistency is firm and elastic. Seldom is there the softness or mobility of the simple colloid goiter. Palpation often reveals lobulation, but never bosselation (nodulation). Coincident fetal adenomas may give one the impression of existing bosselation. Enlargement is not always clinically apparent and even so the consistency of the gland, which is the more important of the two, helps verify the diagnosis. The gland is often tender to the touch. Pulsation with arterial murmurs is never present in the neck.

Nervous Instability.—The nervousness is more that of neurasthenia and its allied disorders never approaching that seen in the thyrotoxicoses. It is that of irritability; these patients are nervous and impatient, and they are easily disgusted with themselves. It is in good faith that they seek medical aid and never do they assume the attitude of defiance seen in the neurotics who delight in telling of the many unsuccessful attempts to bring about their relief or cure. There is no question of doubt that these patients possess an inherited nervous system of inferior quality. So many of these women complain of choking sensations in their necks that are functional in that they are symptomatic of an inferior nervous make-up. It is highly probable that many of the nervous conditions similar to neurasthenia and its allied disorders are unrecognized cases of mild chronic hyperthyroidism. Bizarre psychical manifestations add color to the clinical picture. Mental depression is common, the melancholic type especially manifesting suicidal tendencies which often terminate fatally.

Pelvic Dysfunction.—On examining 100 consecutive unselected cases of interstitial thyrotoxicosis occurring in the female, Hertzler[4] found 87 to have pelvic dysfunction. Seldom is there seen a functionally or anatomically normal pelvis in these women, inflammatory lesions being excluded. Pelvic dysfunction, so characteristic of this endocrine disturbance, is indeed not as frequent in the thyrotoxicoses. The pelvic abnormalities are coincident in that their surgical correction for the relief or cure of dysmenorrhea is disappointing to say the least. Uterine displacements are the most frequent anatomical offenders. The uterus is usually small, its cervix is conical and the external os is pin-point in size.

Not quite one-half of the women suffering this disturbance have dysmenorrhea that is equally either of the ordinary or unusual types. The dysmenorrhea is described either as painful or crampy in character and occurs just before or during the menstrual cycle. In many

the pain is severe enough to incapacitate them and make the bed their best friend during menstruation.

The menstrual periods are more often regular than irregular. When irregular, they readily become regular on medical therapeutic measures in more than the vast proportion of cases. There is no relationship between menstrual pains and menstrual periodicity. In fact the dysmenorrhea may be severe enough to incapacitate the patient and at the same time menstruation be regular in periodicity, and vice versa. More complain of scanty than excessive menstrual flow.

There is nothing typical about the menstrual pain. The lower abdomen, including the outer quadrants, is more commonly affected. When so, the right side manifests the most discomfort. Next in frequency are pains in the outer quadrants of the lower abdomen and of these the right side is the more frequent offender. The pelvic distress and pain often follows the topographical distribution of ovarian pain, namely, radiation over the hip, to the iliac crest or down the thigh.

At times the breasts of these patients are painful just before or during the menstrual cycle. The older school of surgeons were cognizant of an existing relationship between the breasts and pelvic dysfunction, ovarian in origin, and they did oöphorectomies to prevent the further progress of breast cancer.

About 32 per cent of the women suffering interstitial thyrotoxicosis are bothered with pains in the right lower quadrant of the abdomen that are too often diagnosed ''chronic appendicitis.'' In fact these pains occur frequently enough to lure the inexperienced and pecuniary surgeons to their happy hunting grounds, the lower right quadrant of the abdomen, in search of the innocent prey they call ''chronic appendicitis.'' Similar pains, except for their topographical distribution, frequent the left side, but not as often. These pains may be present independent of the menstrual cycle and, when so, are exaggerated during menstruation. Periodicity of menstruation has no direct bearing on the intensity of the pain.

Pathology.—Interstitial goiter is one phase in the diseases of the thyroid gland which, to the present day, is sadly neglected. Goiterous disease occupies the minds of most investigators and their contributions to the literature are indeed voluminous. Just what the relationship of interstitial goiter is to goiterous disease and lymphatism remains to be seen. The fact that these cases are no longer operated on in this clinic, for reasons to be shown later, and that investigation is lacking along this line makes it impossible to make any definite statements other than to give facts as observed in this clinic.

The thyroid is uniformly enlarged and somewhat symmetrical. This enlargement is usually twice the size of the normal gland. Its pinkish

to reddish-brown color resembles that of the hyperplastic goiter. Friability and vascularity are more apparent at the operating table than in the laboratory. A pericapsular fibrosis envelops the gland and makes its delivery difficult for the surgeon. There is lacking the smooth and glistening capsule seen in the colloid goiter. The external surface is often lobulated, but never bosselated. The consistency is firm and elastic (rubbery), approaching nowhere near the firmness to hardness of the more toxic goiter. The gland cuts like rubber. The cut surface is reddish-brown in color and diffusely granular. Fine trabeculae divide the parenchyma into small lobules of various dimensions and outlines.

Unlike the low columnar and cuboidal cells lining the original acini of the hyperplastic goiter, its corresponding cells are flattened out circumferentially, making the nuclei appear spindle-shaped. The cytoplasm of these epithelial cells is scant and their nuclei stain poorly with basophilic dyes. The papillary projections of clusters of columnar cells so characteristic of exophthalmic goiter are never seen. All acini are filled with a compact homogeneous colloid substance that stains eosinophilic and closely resembles coagulated egg albumen in consistency. The tinctorial reaction of the colloid is uniform throughout the gland. Secondary degenerative changes are seldom if ever seen.

Newly-formed acini and so-called "interstitial" cells, forming what is known as a "hypertrophic reaction" and similar to that seen in goiterous disease, are diffusely distributed throughout the gland. Lymphoid accumulations, with or without follicles, quite frequently complicate the picture.

At the interacinar angles are polyhedral areas peppered with interstitial cells. Otherwise these cells are seen in the remainder of the intralobular connective tissue. The term "interstitial" is used to describe the anatomical distribution of these cells and it is not to be confused with the terminology of the endocrinologist who uses the term to designate those cells giving forth a definite hormone concerned in the processes of internal secretion.

With the exception of the newly-formed acini, interstitial goiter finds its exact prototype in the gland of the young somewhere before the age of five years. Here the cytoplasm of the interstitial cells is scant and not very definitely outlined. Their nuclei are large and either round or ovoid and the nucleoplasm appears vesiculated in that it contains many chromatin granules. Except for their shape and increased amount of cytoplasm, the epithelial cells of the newly-formed acini are similar to the interstitial cells.

Other infrequent types of interstitial goiter are seen. Very confusing indeed is the type which, unlike the usual variety, shows a cellular

proliferation within the original acini that makes it similar to the hyperplastic colloid goiter. Microscopically it is impossible to differentiate the two goiters. The postoperative clinical course alone differentiates them, the interstitial type of goiter not being benefited by thyroidectomy.

Much more infrequent is another type in which there is a very marked proliferation of fibrous connective tissue in the interstitium. Here the so-called interstitial cells are replaced by endothelial-like cells. The microscopic picture closely resembles that of fibrocyst-adenoma of the breast, except for the presence of colloid material. This type is not to be confused microscopically with the thyroid of the aged that shows the same interstitial fibrosis.

Our knowledge of the pathology of the ovaries is too meager to permit any extensive description of the ovarian pathology associated with interstitial thyrotoxicosis. In fact Hertzler,[3] as a resident pathologist for twenty years in a hospital where the operators removed ovaries on any pretext, the chief indication of which was for the relief or cure of dysmenorrhea, learned to divide such ovaries into three groups; wholly normal, ovaries with inflammatory lesions, and atrophic ovaries. The first type he found to represent about 95 per cent, the second about 4 per cent, and the last about 1 per cent.

The gross appearance of the ovaries indicates a hypoplastic process. Routine examination of such ovaries while operating within the abdomen for other conditions reveals them to be small, sclerotic, wrinkled on the surface and scarce in graafian follicles.

That the pituitary gland is involved is seen in the typical skeletal build and genital underdevelopment and just what the pathology is remains unsolved.

Diagnosis.—Space will not permit any lengthy discussion on the diagnosis of this disorder. Let it suffice to say that the differential diagnosis includes incipient tuberculosis, chronic hyperthyroidism proper, organic pelvic disorders, psychasthenia, psychoneurosis, effort syndrome, neurasthenia, neurocirculatory asthenia, and even chronic infections.

Should a patient return to the surgeon after the removal of a mildly chronic toxic goiter and complain of the original symptoms for which thyroidectomy was performed, the surgeon should suspect the interstitial type of goiter, review the microscopic sections and he will, in all probability, find out why his patient returned. If the surgeon is laboratory-wise, he will many times diagnose interstitial goiter long before the postoperative clinical course of the disease decides for him.

In the type of interstitial goiter resembling the hyperplastic colloid goiter, the microscopic section easily satisfies the surgeon that he has

removed an offending goiter on its ultimate journey to either the chronic toxic or exophthalmic stages of goiterous disease and just as easily is he dissatisfied later with the end-results of thyroidectomy. It is in this type that the clinical course of the disease after operation is alone his "sheet anchor."

Likewise, should the surgeon prematurely correct any pelvic abnormality, inflammatory lesions being excluded, without beneficial results, he should suspect interstitial thyrotoxicosis. He may find much to his surprise that that which he operated for to be nothing more than the symptoms of this endocrine disorder.

Likewise, the persistence of symptoms following operation for the cure of "chronic appendicitis" should make the surgeon suspect interstitial thyrotoxicosis or intercostal neuralgia (Carnett's syndrome).

Treatment.—The relief or cure of interstitial thyrotoxicosis and its associated dysmenorrhea is never to be found at the operating table. The results of subtotal thyroidectomy for the cure of hyperthyroidism and the results of corrective surgical procedures within the pelvis for the relief or cure of dysmenorrhea are very unsatisfactory to say the least. It is true, however, that subtotal thyroidectomy does at times temporarily relieve the hyperthyreosis and at a later date, months or even years, these patients return worse off than before. Their response then to medical therapeutic measures is more discouraging.

Before proceeding with the treatment advocated at this clinic, it may be well to challenge the work of the roentgenologist who needlessly employs the roentgen ray in the treatment of the chronic hyperthyroidism and dysmenorrhea. Roentgen rays showered at the ovarian regions temporarily relieve the dysmenorrhea and overexposure brings the patient back, within a relatively short time, with a resultant climacteric that is worse than the original affliction. The roentgen-ray treatment of the goiter offers only temporary relief of hyperthyroidism and has no material effect on the associated dysmenorrhea.

Medical treatment, including proper hygiene and rest, offer by far the most encouraging results. When the goiter is treated in the conventional manner, the hyperthyroidism, dysmenorrhea, some of the nervous instability, and pains in the right lower quadrant of the abdomen so commonly diagnosed "chronic appendicitis," disappear in the vast proportion of cases. Often after what may be considered an apparent cure these patients may continue to be more or less nervous, but this is to be expected considering the inherited inferior nervous systems possessed by these unfortunates.

The treatment advocated is by no means a panacea. It can be improved upon, but nevertheless, it has given results in this clinic that are worthy of mention. The response to treatment is not as good

after once the age of twenty-five years is reached. Let it be understood that this age is not considered the maximum age limit beyond which the restitution to normal by medical means is no longer possible. It is never to be forgotten that these women are sick individuals and should be treated as such.

It is my opinion, as well as that of Hertzler, that the primary source of this endocrine disturbance is ovarian in origin. Unfortunately there are not enough reliable medical therapeutic measures at our command to treat this primary source. Ovarian extract and corpus luteum are ineffectual. In that the pathologic picture of the associated goiter declares a hypofunction and that clinical experience indicates that iodides whip the thyroid into activity, potassium iodide is given to stimulate its further function. It is interesting to note in this connection that older clinicians treated dysmenorrhea empirically with potassium iodide. It is possible that this stimulation is brought about by the effect of the iodide on the flattened-out and apparently inactive acinar cells. Smaller dosages of this drug are just as efficacious as larger ones, even then they may be too stimulating.

Sedatives are combined with this stimulant to minimize its effect on the nervous system. Sodium bromide and the fluidextract of hyocyamus are about as satisfactory as any of the sedatives. Bromidism is prevented by the addition of small amounts of Fowler's solution. Should there be constipation a little cascara may be added. In the more nervous individuals, the stimulating effect of the iodide is best preceded by sedatives only. With the diminution of nervous symptoms, the iodide is then started. Many times small dosages of potassium iodide are too stimulating even though preliminary sedatives have been given. Milder stimulants as thyroid extract or the syrup of iron iodide are then substituted. Should a skin rash or an upset stomach bother the patient, luminal is substituted temporarily for the bromide and hyocyamus. It is best, however, to stay with the iodide as long as possible. A more or less standardized prescription used in this clinic is:

		Gm. or c.c.	
R	Potassii iodidi	8	℥ ii
	Fldext. hyocyami	12	℥ iii
	Liq. potassii arsenitis	12	℥ iii
	Sodii bromidi	48	℥ iss
	Rubelixir	q. s. ad 240 or	fl ℥ viii

M. Sig.: Take one teaspoonful in water three times a day after meals.

This medication is continued indefinitely until there is admitted improvement, when it is given twice a day and continued at the discretion and to the satisfaction of the physician. It should be remem-

bered that it takes anywhere from six to eighteen months to effect a cure. There are cases, however, in which cures are effected even over periods longer than eighteen months.

It is best to wait at least six months or more to see what effect medical treatment has on the associated dysmenorrhea before proceeding with any surgery to correct coincident anatomic lesions in the pelvis for its relief or cure. Then anything reasonable may be tried, advising the patient that the corrective operation is compatible with good health and necessary whether or not it relieves the dysmenorrhea. The percentage of cures following these corrective surgical procedures is extremely small. By so advising his patient, the surgeon can protect himself from what is most embarrassing, the persistence of the dysmenorrhea after earnest surgical effort.

Just what is the clinical course of interstitial thyrotoxicosis under treatment? After what may be considered an adequate amount of treatment, the rapid pulse is the first to subside, oftentimes this may require only several weeks. Nervous equilibrium is next reached and next the goiter disappears. It is then that irregular menstrual periods become regular to precede the final disappearance of the dysmenorrhea and pains in the right lower quadrant of the abdomen so commonly diagnosed "chronic appendicitis." Quite frequently the latter pains disappear long before the dysmenorrhea.

Before drawing any conclusions I wish to say for the sake of argument that the therapeutic nihilist may say that these patients get well whether or not the prescribed medication is taken, but the fact remains that these patients get well and are better off without any surgery.

CONCLUSIONS

1. Medical therapeutic measures relieve or cure the vast proportion of cases of dysmenorrhea associated with interstitial thyrotoxicosis.

2. Goiterous dysmenorrhea is a functional disorder for which there is no surgical or roentgen-ray treatment.

3. If interstitial thyrotoxicosis is recognized more often, many needless thyroidectomies, appendectomies and pelvic operations will be unheard of.

4. Pelvic abnormalities, inflammatory lesions being excluded, are coincident to goiterous dysmenorrhea and their surgical correction for the relief or cure of dysmenorrhea are failures in the overwhelming proportion of cases.

5. Pains in the right lower quadrant of the abdomen associated with interstitial thyrotoxicosis and so commonly diagnosed "chronic appendicitis" are symptomatic of ovarian dysfunction and they disap-

pear, as does the dysmenorrhea, under medical therapeutic measures in the vast proportion of cases.

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Fully 50 per cent of girls during their period of development bleed irregularly. This irregularity, however, is not very serious since in the great majority of cases it is transitory.

In cases of continuous bleeding following the initial period, a careful blood examination should be made. A blood disease such as leucemia is very often the cause. Repeated pelvic examinations by rectum must be done. A slow growing benign or malignant tumor may be discovered months after symptoms have appeared. General disease conditions may be causing the bleeding, such as tuberculosis, typhoid, "grippe", pneumonia, in fact all acute and chronic infectious diseases. Acute appendicitis, and both hereditary and acquired syphilis fall within this category.

The rôle that genital hypoplasia plays in the process is difficult to determine. The ductless glands should be investigated. A disordered relationship may act by disturbing maturation of ovum, by injuring blood vessels, or by producing vasomotor changes. In hypo- and hyperthyroidism suitable treatment might result in regularity of menstrual flow. The hypophysis seems to be even more important. The part that the adrenals and other organs play has not been determined.

The "constitution" of the individual may vary. All types, the asthenic, hypoplastic, obese, large, small, etc., can be affected. The type seems to have no significance.

In treatment, the first requisite is the general care of the patient, measures including fresh air, sunlight, rest, attention to bowel elimination, and diet. Climatic changes are especially stressed. Another measure strongly recommended is the correction of static-dynamic decompensation, by such measures as rest in bed or the wearing of compensatory belts, in the hope that the symmetrical distribution of weight will correspondingly cause a symmetrical distribution of blood and in this way perhaps prevent injury to blood vessel walls.

Iron in large doses (6-8 grains daily), strychnine, hypophysis and ovarian preparations, the latter especially when a true genital hypoplasia is present, have been found efficacious. X-ray may be employed to the spleen, hypophysis, and thyroid. X-ray to the ovaries should be avoided as long as possible in the hope that some cause for the bleeding will be found.

Curettage may be performed in some cases but lasting results are not to be expected. Hysterectomy should never become necessary if every therapeutic measure available is used. The primary aim should be to stop the bleeding, rather than regulate the cycle.

FRANK SPIELMAN.

OBSERVATIONS ON A SHORT SERIES OF PLACENTA PREVIA PATIENTS DELIVERED BY ABDOMINAL CESAREAN SECTION AT THE BOSTON LYING-IN HOSPITAL*

By Foster S. Kellogg, M.D., Boston, Mass.

IN 1921 I published a study of 218 consecutive cases of placenta previa treated at the Boston Lying-In Hospital from 1895 to 1919 inclusive. From 1895 to 1915 the maternal mortality was 19 per cent. During these years the method of treatment was version and immediate extraction. From 1915 to 1919 when conservative delivery, bags, or Braxton Hicks version and slow delivery had quite considerably displaced the older method (about 60 per cent), the mortality dropped to 6 per cent, and it was confidently predicted that as these methods were increasingly adopted and more carefully executed the mortality would be reduced still further.

In 1926, five more years having elapsed, during which the series reached 303, an attempt to substantiate this prediction was made. Truly enough conservative methods of delivery had risen about as high as is possible in a hospital handling emergencies (76 per cent) but I was obliged on the findings to reach the following conclusions:

"In spite of previously held opinions, and in the face of the opinions now held by those for whose obstetric judgment I have the most regard I am forced by this study to these conclusions. That all central and partial previas are best treated by low classical abdominal cesarean section, whether the baby be viable or nonviable, living or dead. That marginal placenta previa is best treated by the Voorhees bag. That moribund or very sick patients with placenta previa should be rested and quieted with morphia, bleeding controlled by necessary methods, including tight cervical and vaginal pack and pressure over and above the fundus; transfused, operated as above on pulse and pulse pressure reaction, and retransfused. It should always be the effort to ascertain as nearly as possible how much blood has been lost and to replace that amount as nearly as possible. That hysterectomy following section should be frequently practiced, each case to be considered by itself on the following grounds: risk of sepsis from previous history, persistent bleeding following the section, and number of dependent children at home. If a woman has several as is usually the case, and hysterectomy seems to improve her chances, it should unhesitatingly be done."

These opinions were based on the negative evidence of our statistics and on a study of eight points specially considered, too long to reconsider here in detail, concerned with the causes of death in placenta previa in relation to methods of delivery from below. A consideration of the causes of death in the series made it appear that the main

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*Presented at a meeting of the Philadelphia Obstetrical Society, April 30, 1930.

causes, namely ruptured uterus, hemorrhage, and sepsis could be avoided by section, at least theoretically. Two points in our statistics may be stressed: (1) The maternal mortality in complete previa, 1910 to 1915, 36 per cent, 1915 to 1920, 18 per cent, and 1920 to 1925 and six months, our most conservative period, 25 per cent. It seemed impossible to get worse results by cesarean section. The second may be quoted from the paper. It concerned infant mortality.

"I have taught for many years that the baby in toxemia with convulsions and in placenta previa is of secondary importance. If you save it, so much the better; if you do not and save the mother, you should be satisfied. That no consideration for the baby should alter the treatment against the mother in conditions in which there is so high a fetal mortality in the nature of the disease has been insisted upon. I still believe this in principle, but I am questioning whether in placenta previa, by sacrificing the baby, we are so often saving the mother per se. An analysis of fetal deaths in these five and one-half years, with its 25 per cent complete and its 10.5 per cent general previa mortality, leads me to question this. This analysis shows that in 85 cases 46 infants died or were born dead, a fetal mortality rate of 54 per cent. Twenty of these 46 dead infants either had no fetal heart sounds or weighed four pounds or less. In 3 the weight was not stated. Twenty-three, or 50 per cent of the dead infants, had fetal heart sounds and weighed more than four pounds (many six pounds or more) at stillbirth. We lost 27 per cent of the babies of the 85 mothers either for nothing or to save more mothers, according to the point of view. Of 85 babies, 23 died who might have lived if they had not been subjected to delivery from below. Again I only question whether our maternal mortality justifies this."

In 1931 a new five year period can be studied which may throw some light on the *comparative* values of our methods at present in practice, but it will be 1936 before enough material has accumulated to make this comparison of real value. This statement is put in here to delimit this paper to the title under which it is being read.

About the time my former paper appeared, Irving made a study of his own personally conducted or supervised cases, a considerable series (*Surgery, Gynecology, and Obstetrics*, December, 1927). He found his maternal mortality excellent by conservative delivery from below, mostly Braxton-Hicks version and delivery largely by the patient's own efforts. He was however impressed by the high fetal mortality in perfectly good babies by this method. Furthermore he believed that certainly or potentially infected cases would be wisely treated by abdominal section and supracervical hysterectomy. Chiefly he felt that cesarean section for placenta previa is the baby's operation and hence, since his results from below were excellent, saw no value in section unless the baby was "probably good."

Shortly after this time Dr. Newell in a discussion of cesarean section before the Massachusetts Medical Society expressed the belief that abdominal section had a place in the treatment of placenta previa. He

felt however that it was not necessary or wise except for a "probably good" baby, and that it would not save the moribund placenta previa cases.

Various·other members of the staff had reached conclusions somewhat similar to these if we may judge by what transpired in the years subsequent to 1926.

Prior to 1925, a long time back, a cesarean section was once done on a moribund woman with placenta previa and she died. She is not included in this series. In 1925 a cesarean section was done on a primipara with a partial placenta previa and a rigid os. She recovered. She is not included in this series as this indication has always existed even in the most conservative minds. In 1926 no cesarean sections were done for placenta previa. From then on a reasonable, or possibly unreasonable, amount of enthusiasm for this procedure in this condition has developed and it appears to be growing. For example, in 1927 of 10 complete and partial previas, 4 were sectioned, 40 per cent. In 1928 of 5 complete and partial previas, 4 were sectioned, 80 per cent. In 1929 of 11 complete and partial previas 9 were sectioned, 82 per cent. So far in 1930, 1 complete previa has been sectioned; and for good measure 4 marginal previas have been sectioned during these years against 22 delivered from below.

We have then a series of 22, 14 complete, 4 partial, 4 marginal, for consideration. These sections were done by seven different staff men and several different residents, so results are comparable in this respect with our older statistics which were done by many different staff members, residents, and house officers.

Let us dismiss the marginal group first, four in number. Except that one was a primipara nothing in the other records show that any of them needed a section. One we suspect was done on the rebound from the death of another previa delivered from below, seemingly the result of a mental process which attacks most of us in obstetrics one time or another. I am still of the opinion that marginal previas should not be sectioned unless they are probably infected. In this case a section and a supracervical hysterectomy is my choice. A primiparous marginal previa patient I might section or not depending on how she behaved. The risk of section is greater I believe than the risk of death from the condition in an ordinary multiparous marginal placenta previa patient.

About 80 per cent of the cases were in para iii to v or para v plus groups, equally divided, so that if hysterectomy had been needed for reasons suggested above there was little social objection to it in most of the cases.

The whole group was in at least fair condition when operated upon, most of them in good condition, therefore no light is thrown by this

series on the question whether treatment and section as outlined above on cases entering the hospital *in extremis*, is of value.

Eighteen cases had low classical cesarean sections, one patient had this procedure with hysterectomy, one had it with tubal ligation. One had a Beck and one a modified Kerr, i.e., transverse incision in lower segment, after stripping down the bladder peritoneum. Comment on these will be made later.

The question of bleeding at or after the operative procedure is of interest since the cardinal principle of treatment of a patient already bled is the conservation of all the rest of her blood, a condition often not satisfied by delivery of placenta previas from below. In 12 cases it is specifically stated in the records that there was no bleeding at operation or after, in two nothing is stated so we may assume it was not excessive, in five the bleeding was slight requiring nothing but routine pituitrin administration to stop it. In one instance suture at the placental site was deemed necessary and this stopped the bleeding, transfusion was not necessary. Two cases deserve special mention. No. 5 was a Beck operation. The note reads "Profuse bleeding continued from placental site in lower segment on posterior wall. Patient in poor condition, pulse thin and barely perceptible." No. 10 was a "Modified Kerr"; the note reads, "Bled profusely after baby out, forced to remove placenta, then bled profusely. Condition poor at close of operation." Both these patients recovered. Since one of the less spoken of arguments for cervical section is that it avoids the site of the normally implanted placenta and so conserves blood, it seems logical that if the placenta is situated in the lower segment an incision above this area is indicated. This is borne out since only in these two cases in which the section was started with the patient in good condition did the patient leave the table in poor condition from hemorrhage. It is our practice to wait in cesarean section and let the placenta separate whenever possible. From experience with both methods we know this results in much saving of blood in all cesarean sections.

The matter of bleeding may also be checked by the record of transfusions. Every placenta previa is of course grouped immediately and Group IV donors are readily available for emergencies. In eighteen of these twenty-two cesarean sections, transfusion was not necessary. Three had a single 500 c.c. transfusion, one had two transfusions 1000 c.c. in all. One had a transfusion late in the puerperium for sepsis and low hemoglobin and red count. Of the four patients requiring transfusion for hemorrhage, one was the Beck section, one the Kerr, and two had bled severely on vaginal examination. We will go so far as to submit that this is a very low transfusion rate for placenta previa of these types.

We may now consider the question of fetal mortality in this series. Three babies died that weighed less than 4 pounds. Two babies died that weighed over 4 pounds; one of these weighed 5 pounds, 15½ ounces and was six weeks premature, the other weighed 4-5 and was nine weeks premature. Eighteen babies (twins in one instance) lived. If we take the arbitrary standard of four pounds, irrespective of prematurity, as we did in the previous paper we find that in this cesarean. section series, 18 live babies were obtained out of a possible 20, a mortality of 10 per cent, as against 40 per cent in the series of deliveries from below.

Irving noted particularly the high septic morbidity in his study, and most of us have been impressed with the stormy convalescence of many of our placenta previa cases delivered from below. Sepsis is a common enough cause of death in placenta previa. Ten patients of this series had no fever in the puerperium, six had a "slightly febrile convalescence," four had a "febrile convalescence," and one was definitely septic and sick but recovered. Three patients Nos. 1, 2 (my own), and 6, para vii, vi, and ix respectively, probably should have had hysterectomies on their history. One of these became profoundly septic, one ran a distinctly febrile convalescence, and one was afebrile.

Seventeen patients were examined vaginally, with or without anesthesia, in two records no statement is found, and three patients were operated upon without vaginal examination. In several instances severe bleeding is noted after vaginal examination; once packing was done while waiting preparation for cesarean section. We will return to this later.

Of the twenty-two cases one mother died. This case illustrates the points I wish to make so I will quote her record.

No. 41932, E. B., twenty-two years, para v. Feb. 26, 1926. She had had three normal deliveries and one miscarriage. She had a slight staining one month ago and was put to bed by a visiting nurse. There was profuse bleeding one hour before entrance to hospital and oozing continued. Pulse 120, blood pressure 110/34. Bagging kit was prepared and instruments were assembled for possible laparotomy. Gas examination, profuse bleeding. During preparations patient bled at first severely, then oozed. Low classical cesarean section was performed. Little bleeding with and after placenta. Patient was in poor condition, transfused 400 c.c. citrated blood, then 600 c.c. more. Blood began to ooze from uterus and the patient died. Baby weighed 3 pounds 10½ ounces, nine weeks premature, died. Autopsy in mother showed death due to exsanguination. The lower uterine segment was flabby and the interior surface was very irregular with large projecting fragments of tissue and blood clot. This surface was somewhat trabeculated and extended all around the uterine cavity. Microscopic examination showed the decidual tissue attached directly to the myometrium.

COMMENT

This series of 22 placenta previa patients delivered by cesarean section is too small to use as a basis of comparative value of methods of

treatment in our whole series which now is approximately 375. Many men of experience have delivered more previas than this by other methods without a maternal death. It seems fair however for us to attempt to learn something from our small accumulated experience with this method. Accordingly the following conclusions are presented based upon this study.

<div align="center">CONCLUSIONS</div>

1. Abdominal cesarean section has apparently been accepted as one method of treating cases of placenta previa at the Boston Lying-In Hospital. The indication there is broader than the earlier one of a primipara with a rigid cervix, and differs according to different personal ideas.

2. Nothing in our experience with this procedure to date leads to a feeling that it should be abandoned without further trial.

3. The amount of material to date does not permit of a comparison with our other methods at this time.

4. Incision in the fundus somewhat higher than the usual low classical incision (but entirely below the umbilicus) seems indicated rather than any type of cervical section.

5. The relative incidence of bleeding and sepsis seems satisfactory so far by cesarean section.

6. Ruptured lower segment and cervix do not occur.

7. Apparently the fetal mortality is improved by this method.

8. Probably more patients should have hysterectomies after cesarean section than we have been doing thus far.

9. The occasional occurrence of placenta increata in association with placenta previa should ever be borne in mind. The treatment of this condition is hysterectomy. This was brought out by Hofmeier and reemphasized by me in my second paper.

10. It is probably justifiable to section a few suspected placenta previas without vaginal examination, on the history and bleeding when seen.

11. If as is usually the case, an obstetrician intends to examine a patient vaginally for diagnosis with a possibility of doing a section, he must have not only the kit for bagging or packing boiled and at hand, but as well the cesarean section room must be set up with instruments boiled and set out on the table, nurse and assistants scrubbed and ready for immediate operation. This will many times result in an unnecessary preparation, but will occasionally save a death, or excessive blood loss with the necessity for transfusion and the added risk of sepsis. This is well shown in this series. It is my practice since I determined to section all central and partial previas to have two

operating teams ready before the examination is undertaken.   If the case proves to be a marginal, team one (the examiner) then bags the patient; if it proves to be a central or partial, an immediate section is done by team two.   In this way no unnecessary blood is lost.   This rule should be applied whatever the given operators' indication for or against cesarean section in placenta previa may be.   This conclusion is we believe the most important result of our experience with this series.   If it is impossible to have prepared the operating room or if this has not been done by mistake it is wise to give up the idea of section and forthwith proceed with the initial steps of conservative delivery from below.

12. Although such a conclusion is not justified by this series, I believe the best chance for a previa *in extremis* is that outlined in my previous paper: tight pack, pressure on and over fundus, morphia, transfusion, section on reaction, hysterectomy, retransfusion.   This impresses me the more as I regard in retrospect the manner in which an atonic uterus in a nearly dead woman may ooze out (whether packed or not) the second and third transfusions of blood.   Beyond a certain point foreign blood does not save such patients.   Only in the specimen basin is such a uterus safe.

Since this paper was written four more cesarean sections have been done at the hospital for placenta previa, all in March of this year, bringing our series to twenty-six with no additional maternal deaths. Two were partial, two marginal.   One had a Kerr transverse cervical. She was hysterectomized for persistent bleeding together with the fact that she had already had two high sections for pelvic disproportion.

Six cases out of the twenty-six cases sectioned were marginal.   Since there is nothing in our study of the whole series to justify cesarean section for uninfected marginal placenta previa for the mother these must have been done for the baby; the fetal mortality by our methods having been high in marginal previas.   On consideration we feel this is due to our use of bags and Braxton-Hicks version in this group. Therefore, for a time at least, in the future, I will routinely deliver *marginal* placenta previas by rupture of membranes, and pack if necessary, attempting to get normal deliveries and low forceps, thus hoping to obtain a better and reasonably good fetal mortality while at the same time avoiding the cesarean section risk to the mother.   I will resort to the bag or Braxton-Hicks version only when bleeding is not controlled.   And I will continue to section *partial* and *complete* previas until such time as material warrants a comparative study of results.

19 BAY STATE ROAD.

DELIVERY THROUGH THE NATURAL PASSAGES FOLLOWING CESAREAN SECTION

By Charles M. McLane, M.D., Baltimore, Md.

(From the Department of Obstetrics, Johns Hopkins University and Hospital)

THE dictum "Once a cesarean always a cesarean" is taught and followed in clinical practice in many of the recognized obstetric clinics. On this service, however, a delivery through the normal birth canal after a cesarean section is seen so frequently as scarcely to be a matter of remark. I have, therefore, investigated all the cases of this character that have been on the obstetric service of the Johns Hopkins Hospital between January 1, 1925, and April 1, 1930. All patients who come to our dispensary with the history of a previous cesarean section are registered for delivery in the hospital and admitted about one week before the calculated date of confinement. They are followed very closely, and if the section was done for other indications than pelvic dystocia, a spontaneous outcome is expected. If, however, the section was done for a pelvic indication, the patient is always examined by Dr. Williams in a special clinic, when the type of delivery to be expected is decided upon after all factors have been taken into consideration. Sometimes the decision is not made until just before the expected date of confinement, and occasionally, when the degree of disproportion appears moderate, the patient is subjected to a real test of labor before a final decision is made.

In reviewing the literature on this subject, very few articles were found, including ten references during the past three years, of which three were in English, and the remainder in Spanish and French journals. Furthermore, several of the articles were merely case reports. The most complete study was made by Rice and appeared in the AMERICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY for May, 1927. He reported a series of 96 patients, 76 of whom had subsequent sections and 20 of whom were delivered vaginally (21 per cent). In the discussion that followed this report, in which several of the leading obstetricians of New York took part, the consensus of opinions was that one cesarean usually merited another, and that the only method of decreasing the number of repeated sections was to limit the number of initial operations. Since the policy in this clinic is quite different from the above, a study of a series of cases of pregnancy following cesarean section was deemed advisable.

Wilson reported a similar group of cases from this clinic in 1926, when he was able to collect 138 cases of pregnancy following section who

were admitted to the Johns Hopkins Hospital from 1902 to 1925, and which occurred in 101 women. Sixty-nine per cent of the patients had a subsequent section; 27 per cent were delivered through the natural passages, and 3 had abortions. Our report begins January 1, 1925, and runs to April 1, 1930. Owing to the larger size of the clinic, we are able to report a relatively greater number of cases, as well as a larger number of deliveries through the natural channel in the past five years than in the preceding twenty-three years. It is interesting to note that Wilson's figures of 69 per cent of repeated section and 27 per cent of vaginal deliveries become 57 per cent and 39 per cent, respectively, in our series.

During this five-year period, 108 pregnant patients were admitted to the Johns Hopkins Hospital who had had a previous cesarean section. In 3 of them the pregnancy ended in abortion, so they are not considered here. Of the 105 remaining, 62 patients had another section, 26 were delivered spontaneously, and 17 were delivered by forceps, or by breech extraction. As we were particularly interested in the last two groups, we did not investigate the 62 repeated section cases.

We were particularly interested in the following points in the history of the original operation : indication for section, type of section, whether the patient had a test of labor, course of puerperium, weight of baby following section and following vaginal delivery, and its biparietal measurement, result to baby in both cases, the length of labor in vaginal delivery, moulding of head and type of pelvis. The patients were also studied in regard to race and age.

Of the 43 patients who were delivered vaginally 5 were not included in this report because the baby was premature, and thus precluded the possibility of disproportion. Of the remaining 38 patients, 16 were white and 22 colored. It is interesting to note that in the whites 6 of the previous sections had been done because of pelvic dystocia, and 10 for other indications, such as eclampsia, toxemia, placenta previa, etc., as compared with 14 and 8 cases, respectively, in the blacks. In none of the 38 cases did rupture of the uterus occur. The initial section had been done in this hospital in 23 patients, and elsewhere in 20. Of the sections done here, 15 were for pelvic dystocia and 8 for other reasons. Of those done elsewhere the indication was equally divided between pelvic dystocia and other reasons.

In the previous sections which could be investigated 5 had afebrile and 20 febrile puerperia. In 6 of the latter the febrile course lasted for three days, while in 14 it lasted longer. The condition of the scar at the time of vaginal delivery is difficult to determine from the records, but in certain cases it was noted as being definitely palpable and at times thin.

Of the 38 patients, 33 had one cesarean section and 5 had two. Five of the 38 had had spontaneous labors prior to their sections. The

age at which the section was done ranged from 15 to 38 years, with an average of 20.18 years. Only four sections were done on patients over 23 years old—at 24, 30, 35 and 38 years, respectively; the average age for the spontaneous labor following the section was 23.10 years, with extremes of 17 and 40 years. Two of the sections were of the low cervical type, two with the high midline incision, and the rest classical with the usual infraumbilical incision. Only seven of the sections were done after the onset of labor, and the rest were elective. In only one was a real test of labor given.

We will now turn our attention to the vaginal deliveries following section. As previously stated, none of the patients showed rupture of the uterus and there were no maternal deaths. The shortest labor in this group was $2\frac{8}{60}$ hours and the longest $49\frac{3}{60}$ hours, with the average duration of labor $15\frac{36}{60}$ hours. This, when we consider that for practical purposes most of the patients are primiparae, is a normal figure. Furthermore, in only three patients did the second stage last over one hour, the majority being around one-half hour. Of the 38 cases, 21 were delivered by forceps in which 12 followed sections for pelvic dystocia and 9 for other reasons 14 delivered spontaneously, 7 following sections for dystocia and 7 following sections for other reasons; the 3 remaining cases were delivered by breech extraction and in each of these the section had been done for other than pelvic reasons. The indication for the majority of the forceps deliveries was in order to save the uterine scar from added strain.

DURATION OF LABOR IN HOURS WITH NUMBER AND TYPES OF DELIVERIES IN
PREGNANCY FOLLOWING SECTION

1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35+
5	7	11	3	4	1	4	2
2 Spont.	4 Spont.	6 Spont.	3 Spont.	3 Spont.	1 Spont.	1 Spont.	2 Spont.
1 Forceps	2 Forceps	5 For-		1 For-		3 For-	1 Labor
2 Br. Ext.	1 Br. Ext.	ceps		ceps		ceps	$49\frac{1}{2}$ Hr.

The result to the babies is very interesting. Of the babies obtained on section, 11 were stillborn or died before discharge, which is usually on the twentieth day; in this group are included two prematures who died at $2\frac{1}{2}$ months and 8 months, and a third who died at 6 months of hydrocephalus. Three of the section babies were discharged well but could not be traced later, while 24 were known to be well at least one year after birth. These figures include all the babies obtained prematurely when the section was done for eclampsia, pre-eclampsia, or placenta previa.

Of the babies delivered through the natural birth canal, only 1 was stillborn following a low forceps in which the total duration of labor was $4\frac{55}{60}$ hours. It is interesting to note that this patient had three

other deliveries through the natural passages following the section—one before and two following the death just mentioned. Fifteen of the babies were discharged well, but could not be traced later; while 22 were well at the end of one or more years. In considering the result to the babies, even after deducting the prematures delivered by section, there is hardly any comparison between the two groups of cases—a fetal mortality of 2.7 per cent being nearly ideal. As far as can be determined by a study of the case records, there was no excessive moulding of the child's head following vaginal delivery. Only one case of intracranial hemorrhage is recorded, and it eventually recovered.

Of the 38 patients studied, 25 are known to have had one vaginal delivery following section, 9 had two, 3 had three, and one patient had four such deliveries. The latter, who has been mentioned above, had two sections elsewhere because of a kyphotic funnel pelvis, but in this clinic she had four easy low forceps deliveries and three of the babies weighed more than those obtained by section. This patient finally returned to us in her seventh pregnancy with an unusually large baby; and for this reason a section followed by tubal sterilization was performed.

We were particularly interested in the patients who had vaginal deliveries following cesarean section for pelvic dystocia. In the other group of cases, assuming a normal pelvis, a normal presentation, an average-sized child, and a satisfactory union in the uterine scar, we see no reason for subjecting the patient to another section without a thorough test of labor. Gamble, in the *Bulletin of the Johns Hopkins Hospital*, 1922, has shown that under ideal conditions the muscle unites perfectly and its fibers cross the site of the incision as if it had never been made. From this ideal there are all gradations up to a scar of decidua and peritoneum alone. He has shown that in practically every case there is some continuity of muscle fiber across the site of the scar. If the section has been well done and there is no infection, the site of the scar should be practically as strong as the rest of the uterus.

On the other hand, in the group in which the section was done for pelvic dystocia, there is a much larger field for the exercise of refinements in judgment. The condition of the scar, the size of the baby, particularly the size of the head as patient approaches term, the amount of moulding that may be expected, which, of course, is greater in the negro than in the white, all enter into the consideration of the case. Finally, there is a certain nicety of judgment which comes only from experience, which enables one correctly to balance the interplaying factors, and permits a successful prediction of the course of labor.

In our series are twenty cases in which the previous sections were done for pelvic indications. Eleven of these had their sections and

	UNIT NO. AND RACE	TYPE OF DELIVERY	WEIGHT	BIP.	MOULDING OF HEAD	RESULT TO BABY	DURATION OF LABOR	2ND STAGE	PELVIS	C.D.	T.J.
I	14,124 White	Spont.	3180	?	None	Well 4 yr.	?	?	Simple Flat	10.25	9.25
		C.C.S.	4180	10	None	Well 3 yr.	5 5/60	28/60			
		Spont.	3650	9.25	None	Well 2 yr.	4 55/60	34/60			
		Spont.	3500	9.25	None	Well					
II	628 Col.	L.C.S.	2575	9	Moulded	Well 4 yr.	27 36/60	---	G.C.R. Funnel	10.5	7.75
		L.C.S.	3550	9	None	Well 1 yr.	9 25/60	---			
		Spont.	2700	8	None	Disch. Well	13 50/60	45/60			
III	15,222 Col.	C.C.S.	3440	10	None	Well 1 yr.	---	---	Flat Rachitic	11	8.25
IV	11,600 Col.	L.C.S.	3840	10	Caput	Well 1 yr.	39 57/60	---	G.C. Funnel	10.75	7.75
		Spont.	3340	10.5	None	Well 1 yr.	17	25/60			
V	278 Col.	C.C.S.	3240	8.75	None	Well 9 yr.	2	?	G.C.R.	11	10
		Spont.	3040	8.5	None	Well 6 yr.	23 54/60	13/60			
		Spont.	3425	9	None	Well 4 yr.	8 4/60	10/60			
		Spont.	3500	10	None	Well 1 yr.	9 10/60				
VI	7,595 Col.	C.C.S.	3650	8	None	Well 2 yr.	---	---	G.C.R.	10.5	10.25
		C.C.S.	2790	8.5	None	Well 1 yr.	---	---			
		Low For.	3150	8.5	None	Disch. Well	13 48/60	53/60			
VII	138 Col.	C.C.S.	3260	9.25	None	Well 7 yr.	---	---	Flat Rachitic	10.5	10.5
		C.C.S.	3490	9	None	Well 3 yr.	---	---			
		Spont.	3235	8.5	None	Well 2 yr.	---	---			
		Spont.	3500	9	None	Well 2 yr.	9 6/60	21/60			
		C.C.S.	3800	9.5	None	Well 1 yr.	21 15/60	?			

	UNIT NO. AND RACE	TYPE OF DELIVERY	WEIGHT	BIP.	MOULDING OF HEAD	RESULT TO BABY	DURATION OF LABOR	2ND STAGE	PELVIS	C.D.	T.I.
VIII	? Col.	C.C.S.	2830	9.25	None	Well 1 yr.	4 55/60	30/60	G.C.R.	10	8.5
		Spont.	3050	8.75	None	Well 6 wk.	14 45/60	?			
		Spont.	2425	8.5		Well 1 yr.	15 26/60				
IX	12,205 White	C.C.S. (Bre)	2340	9	None	Disch. Well	6 29/60	35/60	Simple Flat	11.5	8.25
		Mid. For.	3700	9.75	None	Disch. Well					
X	9,827 White	C.C.S.	3470	9.75	None	Disch. Well	11 33/60	31/60	G.C.R.	10.75	8.75
		Spont.	3200	8.5	None	Well 1 yr.	20 51/60				
XI	9,121 White	Spont.	2520	8	None	Died 1 mo.	15 44/60	?	G.C.R.	10.25	10
		Spont.	2907	9	None	Well 8 yr.	?	?			
		C.C.S. (Bre)	3290	9.5	None	Well 6 yr.					
		Low For.	3050	8.5	None	Disch. Well.	21 14/60	53/60			

Section Done in Hospital Other Than Johns Hopkins

	UNIT NO. AND RACE	TYPE OF DELIVERY	WEIGHT	BIP.	MOULDING OF HEAD	RESULT TO BABY	DURATION OF LABOR	2ND STAGE	PELVIS	C.D.	T.I.
XII	6,794 Col.	C.C.S.	2890	?	None	Well 7 yr.	---	---	Kyphotic Funnel	12	7.25
		C.C.S.	2500	?	None	Stillborn	---	---			
		Low For.	2420	9.5	None	Well 4 yr.	3 59/60	?			
		Low For.	3320	9	None	Stillborn	4 55/60	1 1/60			
		Low For.	3010	9	None	Well 2 yr.	9 47/60	30/60			
		Low For.	3425	10	None	Well 1 yr.	12	7/60			
XIII	26,935 Col.	L.C.S.	3190	9	None	Well 2 yr.	34 5/60	1 48/60	G.C.T.	11.5	8.5
		Low For.	2970	8.5	None	Well 6 wk.	10 53/60				

subsequent deliveries in this clinic; nine had the sections elsewhere. Some difficulty was encountered in obtaining from other hospitals data on the section and the result to the baby; those which could be obtained are reported. The eleven done here are reported in detail. We obtained data on two cases done elsewhere, which brings our total up to 13; and a table of these cases follows. The table itself is practically self-explanatory.

The following points may be emphasized: 11 of the sections were done for pelvic dystocia, while 2 combined a pelvic contraction with a breech presentation; 7 of the patients had elective sections, 6 of them tests of labor ranging from 2 to $39^{57}/_{60}$ hours. Of the 7 who had elective sections, 5 subsequently had a larger baby per vaginam, and of the 6 who had a test of labor, 2 subsequently had a larger baby by the vaginal route. In 6 of the patients the delivery after section was ended by forceps in order to spare the uterine scar, and 7 had a spontaneous outcome. Two of the above patients had a spontaneous delivery before the first section. The duration of labor in the vaginal deliveries varied from $35^{5}/_{60}$ to $23^{54}/_{60}$ hours and there were only two second stages of over one hour. The puerperium was afebrile in 3 of the sections and febrile in 14. Four of the patients had two sections before the vaginal delivery and in at least one of these the puerperium was febrile. A chart of the puerperia is given.

Type of Puerperium

3 Afebrile
1 Febrile 3 days
1 Febrile 5 days
1 Febrile 6 days
4 Febrile 7 days
1 Febrile 8 days
1 Febrile 14 days
5 Febrile (length not given)
──
17 Total

As regards the children—there was 1 stillborn in 17 sections and 1 stillborn in 23 subsequent vaginal deliveries. All of the other children were well on discharge.

CONCLUSIONS

1. The dictum "Once a cesarean always a cesarean" is not necessarily true in clinical practice.

2. Each case presents a separate problem and decision should not be made until after a careful study of all the facts at hand. In doubtful cases it need not be made until the second stage of labor.

3. The increasing number of sections being done throughout this country and the tendency to use this operation for nonpelvic reasons makes this problem more important.

4. The condition of scar and type of puerperium, while important, do not necessarily contraindicate a vaginal delivery.

5. Even when the initial section was done for pelvic reason, we are often too ready to do a second section rather than give the patient a chance for a normal type of delivery.

6. The outcome for the baby in normal deliveries following cesarean section for pelvic contraction is good.

7. In 38 cases allowed to go through labor following section, no rupture of the uterus occurred.

I wish to express my appreciation to Dr. J. Whitridge Williams and Dr. Charles H. Peckham for their suggestions and help in compiling these data.

Gragert, O.: **Hypernephroma Metastases in the Vagina.** Arch. f. Gynäk. **136:** 166, 1929.

The author reviews the ten cases which he was able to find in the literature with secondary growths of hypernephromas and adds one case of his own. This patient was fifty-three years of age with a history of a bloody vaginal discharge. Examination showed an ulcerating, pedunculated, dark red mass the size of an hazelnut on the anterior wall of the vagina just below the external urinary meatus. Microscopic examination of this tumor showed it to be an hypernephroma. Several months later the patient was operated upon for an abdominal tumor which proved to be an hypernephroma the size of a man's fist growing from the upper pole of the left kidney. Following its removal the patient made an uneventful recovery.

RALPH A. REIS.

THE USE OF THYMOPHYSIN—A REPORT OF 35 CASES

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A T THE 1929 meeting of the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons, Doctor Nicholas Temesvary of Budapest read a paper entitled, "A Rapid Nonsurgical Procedure for Aiding Childbirth."

Temesvary after a series of experiments with the extracts of the various glands of internal secretion found that of the thymus best suited for the production of rhythmical uterine contractions. The lack of intensity, however, prompted him to combine this extract with pituitrin. He claims that the resulting preparation, known as Thymophysin, materially shortens the duration of labor. This is accomplished by increasing the numerical occurrence as well as the intensity of the contractions without interfering with rhythm or normal physiology.

His report is based on observation of over a thousand cases in which the preparation was employed. He states that the average duration of labor in multiparae is from two to three hours and primiparae from three to five hours. He uses the preparation also in pathologic cases when a rapid labor is desirable, such as premature or artificial rupture of the membranes, primary inertia, elderly primiparae, slightly contracted pelves, marginal placenta previa and toxemias.

Thymophysin has been employed in Europe for several years and there is considerable German literature on the subject. There are but few American reports, however. Haynes of Detroit reported 50 cases in 1928 and Jarcho 18 cases in January of this year. We have been using the preparation since October, 1929, and offer a summary of 35 cases.

The first group includes twelve normal labors in which Thymophysin was used in the first stage (Table I).

Case 1: There was a definite increase in intensity of pains and spontaneous delivery resulted 1 hr. 10 min. later. Case 7: Following the injection, the interval remained the same, but pains were much harder; delivery was completed in 20 min. Case 9: Pains were definitely increased and spontaneous delivery occurred in 55 minutes. Case 10: The action simulated that of unmodified pituitrin. An ampule given after 19 hours of labor produced a tetanic contraction lasting 2½ minutes. Morphine sulphate gr. ¼ was necessary for control. Four hours later the cervical dilatation was the same and the pains had become irregular. Injection of ½ ampule of Thymophysin was followed by a contraction lasting 5 minutes. Pains

TABLE I

NO.	PARA	POSI-TION	DOSE	IN LABOR BEFORE THYMO.	CERV. DIL. AT TIME OF INJEC.	INTERVAL OF PAINS BEFORE	INTER-VAL OF PAINS AFTER	TIME TO COM-PLETE DILA-TATION	SECOND STAGE
1	ii	LOA	1.1 c.c.	3½ hr.	3½ fing.	6-7 min.	3-4 min.	1 hr.	10 min. Spon. Delivery
7	ii	ROP	1.1 c.c.	7½ hr.	4½ fing.	1½ min.	Same	5 min.	15 min. Spon. Delivery
9	ii	ROP	1.1 c.c.	5¾ hr.	3½ fing.	2-3 min.	1 min.	5 min.	50 min. Spon. Delivery
10	i	ROP	1.1 c.c. 0.5 c.c.	19 hr. 23 hr.	3 fing. 3 fing	5 min. Irreg.	Cont. 1 min.	18 hr. 14 hr.	1½ hr. Prophyl. Forceps
14	iv	ROP	0.5 c.c.	8½ hr.	3½ fing.	4 min.	1 min.	1¼ hr.	20 min. Man. Rotation Low Forceps
17	iii	LOP	0.5 c.c.	5¾ hr.	3 fing.	2½ min.	Same	15 min.	15 min. Spon. Delivery
19	iv	LOA	0.5 c.c.	7¼ hr.	2½ fing.	Irreg.	2 min.	20 min.	10 min. Prophyl. Forceps
27	iv	ROP	0.25 c.c.	3¼ hr.	4 fing.	Irreg.	3 min.	45 min.	10 min. Prophyl. Forceps
30	v	LOP	0.25 c.c.	18 hr.	5 fing.	5 min.	2 min.	5 min.	20 min Spon. Delivery
31	i	ROP	0.25 c.c.	3 days	5½ fing.	Irreg.	1 min.	15 min.	45 min. Prophyl. Forceps
33	iii	LOA	m2	5 hr.	2½ fing.	Irreg.	2 min.	45 min.	21 min. Prophyl. Forceps
34	iii	ROP	m3	7¼ hr.	3¼ fing.	1 min.	Same	20 min.	13 min. Prophyl. Forceps

again became much harder, but dilatation was not complete until 14 hours later. The delivery was normal. Case 14: There was a definite increase in intensity. Dilatation was completed in 1¼ hours. Delivery was by manual rotation of head and immediate low extraction. Case 17: Spontaneous delivery occurred in 30 minutes—a very nice result. Cases 19 and 27: These cases gave excellent results —irregular pains in each instance were converted into regular contractions and spontaneous deliveries followed promptly. Case 30: A multipara with active pulmonary tuberculosis. The Thymophysin preceded an intravenous injection of 7½ gr. of sodium amytal. Spontaneous delivery followed the production of very hard contractions. Multiple mucous membrane lacerations were observed following delivery. Case 31: This patient had irregular pains for about 3 days—when pains became regular, the cervix was 4 fingers dilated. Thymophysin was administered. A laceration of the mucous membrane of the posterior wall about the size of a half dollar was found by vaginal examination. This tear occurred prior to any manipulation and was undoubtedly due to the pressure of the head caused by the increased intensity of the contractions. Spontaneous rotation of the head occurred and delivery was completed in 1 hour. Case 33: Irregular pains were converted into regular contractions and delivery followed promptly. Case 34: Pains were markedly increased in intensity although the interval remained the same. The membranes were ruptured artificially shortly after the injection. A few minutes later the fetal heart was noted to be quite slow; examination revealed an occult prolapse of the cord. This was replaced. The heart rate increased and the child was delivered by prophylactic forceps.

The second group includes eight cases in which Thymophysin was injected during the second stage (Table II).

TABLE II

NO.	PARA.	POSITION	DOSE	IN 2ND STAGE BEFORE INJEC.	ANESTHETIC	CONTRACTIONS	TIME TO DELIVER	DELIVERY
20	ii	L.O.A.	.25 c.c.	10 min.	N_2O-O_2	+	20 min.	Spontaneous
21	i	L.O.A.	.25 c.c.	2 hr.	N_2O-O_2	+	20 min.	Mid-forceps extraction
22	i	L.O.A.	.25 c.c.	1½ hr.	N_2O-O_2-E	+	11 min.	Prophylactic forceps
23	i	R.O.P.	.25 c.c.	30 min.		3 min.	1¼ hr.	Prophylactic forceps
24	i	R.O.P.	.25 c.c.	45 min.	N_2O-O_2-E	+	24 min.	Low forceps extraction
25	ii	L.O.A.	.25 c.c.	10 min.	N_2O-O_2-E	+	10 min.	Prophylactic forceps
26	i	R.O.P.	.25 c.c.	20 min.	N_2O-O_2	+	45 min.	Low forceps extraction
32	ii	L.O.T.	m3	5 min.	N_2O-O_2-E	+	20 min.	Prophylactic forceps

Case 20: Developed a late secondary inertia. Thymophysin produced regular contractions and spontaneous delivery was effected. Case 21: Likewise developed an inertia after 2 hours of second stage—the contractions converted an expected difficult mid-forceps extraction into an easy delivery. Case 22: A prophylactic forceps delivery was facilitated—the preparation being administered after the patient was under gas-oxygen anesthesia. Case 23: The patient presented an R.O.P. at the spines after she had been in the second stage 30 minutes—pains were irregular. The intensity and regularity of the pains showed a marked improvement after Thymophysin—rotation was spontaneous and there was a good crown in 40 minutes. Following delivery, however, this patient had a moderately severe postpartum hemorrhage. During the 12 hours in first stage she had received only ⅙ gr. of morphine, ½₀₀ gr. of scopolamine and 1 bottle of ether and oil (Gwathmey). Case 24: A compound presentation—R.O.P. and hand. Intensity of pains was markedly increased—patient was draped for delivery and under gas-oxygen anesthesia when the Thymophysin was given—vaginal examination revealed an occult prolapse of the cord (fetal heart was 80). A living child was delivered by rapid low extraction. Case 25: A marginal placenta previa—membranes were ruptured to control hemorrhage. Administration of Thymophysin preceded a prophylactic forceps delivery. Case 26: Administration with patient under gas-oxygen anesthesia—good contractions produced. The outlet, however, was markedly contracted and delivery effected by a very difficult low forceps extraction. Case 32: Patient was fully dilated on admission and immediately anesthetized. With preparations for delivery completed, she was allowed to come out of the anesthetic—pains were irregular. The Thymophysin brought about regular contractions and the delivery was completed.

The remaining fifteen cases showed various abnormalities (Table III).

Cases 3, 28, 35: These were true primary inertias. The result in the first instance was spectacular. The second case did not prove as successful. Following the first injection the contractions increased, but dilatation was not effected. The

TABLE III

NO.	PARA.	POSITION	COMPLICATION	DOSE	CONTRAC-TIONS	TIME COMP. DIL.	2ND STAGE	REMARKS
3	i	R.O.P.	Prim. inertia	1.1 c.c.	+	35 min.	1 hr. Proph. for.	21 hr. labor
28	i	R.O.P.	Prim. inertia	.25 c.c. .25 c.c. .25 c.c.	+ ± +	19 hr. 3 hr. 1 hr.	Cervix 5½ f. Mid-forceps extraction	40 hr. labor. Man. dil. and rotation
35	i	L.O.A.	Prim. inertia Dry labor	m. 3 m. 3	+ +	4½ hr. 2¼ hr.	Cervix 5½ f. Mid-forceps	76 hr. labor. Cer. incised
11	ii	·R.O.P.	Pre-eclampsia	.5 c.c.	+	3 hr.	25 min. for. Rot. and low extraction	Rise B.P. 40 points
5	iii	R.S.P.	Pre-eclampsia Bag insertion	1.1 c.c. 1 1 c.c.	+ +	2 hr. 3 hr.	Bag expell. Breech ext.	Bag insert. induce labor
15	ii	L.O.P.	Bag insertion	.5 c.c. .5 c.c. .5 c.c.	Same + +	24 hr. 20 hr. 4 hr.	Cervix 5½ f. Spont. rot. and low extract.	Bag expell. before Thymo. injection

other two injections were perhaps a little more satisfactory, but 1 hour after the last, delivery was deemed advisable—there still remained a slight rim of cervical tissue which was dilated manually. Manual rotation of the head was followed by a mid-forceps extraction. The results were likewise unsatisfactory in Case 35. In this instance the membranes ruptured 27 hours after the onset of labor—at which time the cervix was 2 fingers dilated. The dilatation had not changed materially 28 hours after the rupture of membranes, and No. 4 Vorhees' bag was inserted—the bag was expelled in 3½ hours. Thirteen hours later, which was 72 hours after the onset, the cervix was 4½ fingers dilated—the pains were irregular. Thymophysin (m3) was given and the same dose repeated in two hours. The contractions increased after each injection but there was practically no change in cervical dilatation. After the latter medication, the fetal heart rate increased noticeably and meconium appeared mixed with amniotic fluid. In the interest of the child, the cervix was incised anteriorly and posteriorly and a mid-forceps extraction done. Cases 11 and 5: These were pre-eclamptics. In the first instance the contractions were markedly increased in intensity. Morphine was given for control. After 3½ hours, the head was well down, but in a transverse position. Barton forceps were applied and a low extraction accomplished. Following Thymophysin, the blood pressure increased from 160/100 to 200/100. In Case 5: A No. 4 Voorhees' bag was inserted to induce labor. As soon as the pains began, an injection was given; pains became hard and the bag was expelled in 2 hours. The pains then diminished and the Thymophysin was repeated. Conditions were satisfactory for an easy breech extraction 3 hours later. Case 15: A No. 4 bag was expelled 12 hours after insertion. The pains immediately became feeble. Three successive doses of Thymophysin increased the intensity of the contractions, but had little if any effect on the cervical dilatation. Twenty-four hours after the first Thymophysin, the cervix was 5½ fingers, the head had rotated and a low extraction was done.

The final group of cases presented varying degrees of contractions of the pelvis (Table IV).

Cases 2, 6, 8: These were multiparae with histories of difficult deliveries—each presented a male type of pelvis with some degree of contraction and an increase in inclination. In Case 2, the head could barely be reached by rectal examination after a ten-hour test of labor. The slight amount of overlapping of the fetal skull bones justified this test and the use of Thymophysin. A little more than an hour after the injection, the head was low in the pelvis. Barton blades were applied in the transverse diameter, and a fairly easy low extraction accomplished. In 6, the head was at the brim and the cervix undilated. One hour after the injection, it was possible to apply the Barton blades and perform a high extraction. Likewise, in Case 8, the increase in contractions aided dilatation. A myocardial condition of the mother necessitated a high forceps extraction 5 hours later. Cases 4 and 18: These were border-line pelves and there is little doubt that the Thymophysin was in a large degree responsible for comparatively easy vaginal deliveries—in the latter, prophylactic forceps delivery also was facilitated by Thymophysin in the second stage. Case 12: A breech presentation remained high after 20 hours of labor in a questionable pelvis. Cesarean section was seriously considered, but breech extraction was successfully accomplished following two injections of the preparation. Case 13: This case presented a serious problem in as much as she was seen 2 days after the membranes had ruptured. Labor had been intermittent, but sufficiently prolonged to give a good test. The pelvis was small and the head barely dipping in the brim. Two injections were given and vaginal delivery accomplished. Case 16: This patient received ½ ampule 19 hours after the onset of

TABLE IV

NO.	PARA.	POSITION	PELVIS	DOSE	CONTRAC- TIONS	TIME TO COMP. DIL.	2ND STAGE	REMARKS
2	iii	L.O.T.	Male type	1.1 c.c.	+	1¼ hr.	Low forceps extraction	Barton forceps
6	v	R.O.P.	Male type	1.1 c.c.	+	54 min.	High forceps extraction	Rapid dilatation
8	v	R.O.P.	Male type	1.1 c.c.	+	5 hr.	High forceps extraction	Cardiac
4	i	R.O.P.	True conj. 9 cm.	1.1 c.c.	+	45 min.	Prophylactic forceps	12 hr. labor
18	i	L.O.A.	True conj. 9.5 cm.	.5 c.c. / .5 c.c. (2nd stage)	+	3 hr. / —	Prophylactic forceps	19 hr. labor
12		R.S.A.	True conj. 10.5 cm.	.5 c.c. / .5 c.c.	+ / +	4 hr. / 30 min.	1 hr. breech extraction	25 hr. labor
13	i	L.O.P.	True conj. 9.5 cm.	.5 c.c. / .5 c.c.	+ / +	2½ hr. / 1½ hr.	3 hr. prophylactic forceps	Dry labor
16	i	R.O.P.	Trans. out. 9 cm.	.5 c.c.	+	3½ hr.	Mid-forceps extraction	Postpartum hemorrhage
29	ii	L.O.A.	Trans. out. 9 cm.	.25 c.c.	+	3 hr.	High forceps extraction	Manual dilatation

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labor. Three hours later the cervix was 5½ fingers dilated; maternal pulse had risen to 130 (she had had 3 hypodermies of scopolamine aggregating ¹⁄₁₀₀ gr.). Dilatation was completed and a mid-forceps extraction done. A severe postpartum hemorrhage occurred—uterus and vagina were packed—clysis and transfusion given —pulse reached 160. Recovery was good, however. Case 29: Following ¼ of an ampule, contractions became exceedingly severe. Morphine sulphate (gr. ⅙) failed to control them and a general anesthetic was administered, even gas-oxygen and ether failed to curb them entirely. The cervix became quite rigid and then edematous. Three hours after the Thymophysin injection, a definite contraction ring was noted—the cervix was approximately 4½ fingers dilated. Fetal distress necessitated a manual dilatation and the child was delivered by a high forceps extraction.

ADMINISTRATION

Temesvary feels that Thymophysin is probably most effective when given at the beginning of the first stage. The various authors fail to agree as to efficacy during the second stage. Our results seem to indicate an equal effectiveness in either stage.

The dosage was originally given as 1 ampule (1.1 c.c.), but there is a definite trend toward smaller doses. Lately we have found ¼ ampule, or even less (m4-m3) to be a sufficient dose. The preparation may be repeated after one hour if necessary. It is given as a deep intramuscular injection, preferably in the gluteal region.

CERVICAL DAMAGE

With such added intensity as is seen following Thymophysin we must consider the possibility of uterine damage. We are able to report on cervical inspection in eighteen of the cases:

One case was seen immediately after delivery—the patient was a multipara (19). A bilateral laceration—1 inch on each side was seen. There was no hemorrhage. The remaining seventeen observations were made at the six weeks postpartum examinations. Four primiparae (10, 12, 16, and 23) showed no cervical pathology. Three primiparae (21, 24, 26) showed no laceration, but slight erosions. The remaining primiparae (22 and 28) each showed a bilateral slit of 1/16 of an inch as well as erosions of the anterior and posterior lips. The multiparae were as follows: No. 2, bilateral laceration, ¼ inch; No. 6, bilateral laceration, ½ inch; No. 8, bilateral laceration, ¼ inch; No. 14 transverse slit and erosion; No. 15, slight subinvolution, bilateral laceration, ¼ inch, slight redness; No. 17, slight erosion; No. 25, erosion of anterior and posterior lips; No. 27, laceration, ¹⁄₁₆ inch, no erosion, slight redness.

From these observations, too few, however, to draw general conclusions, it may be said that the cervical damage is no more extensive or frequent in incidence than where Thymophysin is not used.

GENERAL CONSIDERATIONS

In the majority of cases, we used the preparation in conjunction with combined morphine, scopolamine and rectal ether (Gwathmey) medication for analgesia. The resulting forceful contractions in the second stage made possible oftentimes a spontaneous delivery before the effect of the analgesic drugs had been lost. The type of analgesia in the first stage was in no way interfered with by the use of Thymophysin. In fact, the analgesic action is desirable with the increased intensity of the uterine contractions.

Unfortunately we have no observations of value to report as to blood pressure. In one toxic individual (No. 11) a rise of forty points in the systolic pressure (from 160 to 200) was noted. Jarcho reports a temporary rise followed by a fall. The depressing effect of thymus extract on the blood pressure is held to neutralize any elevation caused by the pituitrin content of the preparation.

In the normal first stage cases, varying degrees of success, as measured by rapid cervical dilatation, were seen in approximately 84 per cent of the cases; in the second stage group expulsion was aided satisfactorily in about 88 per cent; good results were obtained in 73 per cent of the so-called abnormal group. There were no maternal or fetal deaths. One morbidity (No. 23) was due to a mild pyelitis and another individual (No. 31) developed a mild unilateral thrombophlebitis.

COMMENTS

The enthusiastic character of the existing literature and our anticipation of the popular reception of Thymophysin in this country leads us to discuss the disturbing incidents we have occasionally seen following its use.

We wish first to mention four cases (10, 11, 30, and 33) in which the action was quite similar to that of unmodified pituitrin. The contractions were tetanic in character. In another instance (29) the contractions were exceedingly intense. Morphine sulphate gr. $\frac{1}{6}$ had no effect and they were not completely controlled by gas-oxygen-ether anesthesia. This individual developed a contraction ring.

Two of the cases (16 and 23) had postpartum hemorrhages. In neither instance was an excessive amount of narcotic or sedative drug used. We cannot claim that Thymophysin was the causative factor in either of these hemorrhages, but we mention the accidents, especially since we seem to note more than normal bleeding after some of the other cases. This was especially true when the preparation was administered late in labor. The strong contractions had to be controlled at the time of delivery in order to protect the perineum. As a rule, this could be accomplished only by a comparatively deep stage of anesthesia, which sometimes gave us a sluggish uterus to deal with following birth.

In two instances (24 and 34) occult prolapse of the cord was found. This may have been purely coincidental, on the other hand the increase in intensity of the contractions following Thymophysin may have been a factor.

A definite instance of fetal distress was noted in one of the primary inertia cases (35). After the second injection of Thymophysin, which precipitated very strong contractions, there was a discharge of meconium accompanied by a rapidly rising fetal heart rate. Immediate delivery was necessary in the interests of the child and the cervix had to be incised. In another case (29) a rapidly rising fetal heart rate following an injection, necessitated a manual dilatation and a high forceps extraction.

CONCLUSIONS

The comparatively small number of cases in this series does not permit general conclusions. We are convinced, however, that Thymophysin is a very powerful uterine stimulant. We would advise against its use in the dose recommended by Temesvary, since less than one-quarter of that dose in our hands produced violent uterine contractions. Occasionally the drug simulates unmodified pituitrin. Preparations, therefore, should always be made to meet such emergencies as tetany or threatened rupture of the uterus, injury to the lower segment or cervix, and extensive laceration of the soft parts. We feel that, as yet, sufficient study has not been made to warrant general and indiscriminate use of this drug.

103 MEDICAL ARTS BUILDING.

Quin, J. S.: **Acute Inversion of the Uterus.** Irish Journal of Medical Science, page 115, 1930.

Gangrene and interference with the uterine circulation can occur only when there is a constricting ring of cervix through which the inversion of the uterus has occurred. It is therefore suggested that in any case in which manual replacement at the time of occurrence is either inadvisable on account of the patient's condition or immediately unsuccessful, that this ring should be sought for and, if present, obliterated by entirely completing the inversion by gentle traction. There will be less danger of sepsis in a uterus with a good blood supply.

WM. C. HENSKE.

THE BIOLOGIC DIAGNOSIS OF EARLY PREGNANCY BY THE ASCHHEIM-ZONDEK TEST

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THE diagnosis of early pregnancy has proved of great difficulty to the practitioner of medicine even until the present time. Both to the patient, and especially to the consultant, a positive diagnosis of pregnancy often is of the greatest importance, and heretofore has been a problem that could not be solved until sufficient time had elapsed to allow the diagnosis by definite palpatory findings. If the profession now seems to evidence a certain skepticism toward this new method of determining an early pregnancy, one hardly can be surprised, if we recollect the enthusiasm accorded the diagnostic methods of Abderhalden, Kamnitzer, Dienst and others, which now have been discarded.

The Aschheim-Zondek pregnancy test is only two years old but its excellent results consistently have been confirmed by all who have experimented with it.

After we had familiarized ourselves thoroughly with the technic of this test and had proved to our own satisfaction its absolute reliability in control tests on definitely pregnant, and other women positively not pregnant, and also on men, we began to run tests only in those cases in which the diagnosis was of importance clinically. The series here reported includes instances in which a differential diagnosis was made between normal pregnancy and such conditions as abdominal and pelvic tumors, soft fibroids, missed abortions, death of fetus in utero, ectopic pregnancy, primary and secondary amenorrhea, etc.

We also made use of the test for the purpose of establishing or excluding very early pregnancy in women suffering from serious organic disorders in whom the continuance of a complicating pregnancy was expected to prove serious.

Our technic differed slightly from the original procedure of the German investigators as we used but two white infantile mice instead of five, injecting 0.4 c.c. of the first morning specimen of urine twice daily for three days. This is a slightly larger amount than was originally employed. Urines voided early in the morning had to reach the laboratory before nine o'clock. They were immediately acidified to litmus and placed in the refrigerator. No chemical preservative was added at any time, a fact which might explain our low death rate among the experimental animals. Most of the German experimenters recommend the use of mice weighing between six and eight grams, which they found

to correspond to approximately an age of twenty-one days. Since we bred our mice in our own laboratory under particularly favorable conditions and thus knew exactly their age we observed that the usefulness of the animals for this biologic test was more reliably determined by the age of from twenty-one to twenty-four days than by mere weight. We noticed that in the case of small litters the original weight and weight progress of the individual animals was larger than in large litters, in which at times animals did not reach six grams before they were four weeks old. At that age a mouse is too near natural maturity to be any longer reliable for a test of this sort. Our animals were sacrificed ninety-six hours after the first injection, and ovaries and uterus carefully examined. It is a particularly noteworthy fact that without an exception in every positive test the so-called anterior pituitary reaction two (A. P. R. 2) was demonstrable, i.e., hemorrhagic spots (Blutpunkte) were visible to the naked eye. For further study serial sections were made of many ovaries to ascertain presence or absence of reactions A. P. R. 1 (ripening graafian follicles) and A. P. R. 3 (luteinization).

Up to the time of this report we had made eighty-nine tests for diagnostic purposes with only two failures (2.2 per cent). In one pregnant woman the first test was negative but became positive three weeks later. Another patient seems to be pregnant, but the diagnosis cannot as yet be made positive on palpatory findings. Three tests made on her so far have remained negative, both on macroscopic and microscopic study of the injected mice. Further developments in this case probably will explain this most unusual experience with this test. In no instance did we obtain a positive test in the absence of pregnancy.

We were called upon to make the differential diagnosis between fibroid and pregnancy thirteen times. Clinical observation finally confirmed our biologic diagnosis in every instance. Three cases of ectopic pregnancy gave positive reactions, while three cases of missed abortion were negative. In the cases of amenorrheic women, many of them obese, the test proved particularly useful since it was negative in every case in which the amenorrhea was not due to pregnancy.

A few illustrative cases might be mentioned:

CASE 1.—A thirty-year-old nulliparous woman, married nine years, referred for operation because of diagnosed fibroid. Patient asserted that she was menstruating regularly about every twenty-eight days, the last time a week ago, but that of late the flow had considerably decreased in amount. Examination conveyed the suggestion of palpable fetal parts and made the diagnosis of fibroid very doubtful. Therefore, a test was made, which was positive for pregnancy. Two weeks later the fetal heart tones were heard.

CASE 2.—A twenty-seven-year-old patient gave the history of having menstruated but three times annually since onset of menses at the age of thirteen. Flow always of moderate severity and four days' duration. Since her marriage, five years ago, she has been examined during amenorrheic states at three occasions by reliable

obstetricians and in each instance was told that she was pregnant. At each of these examinations the uterus (?) was supposed to have been palpated abdominally and a serous discharge expressed from the breasts. In each instance the amenorrheic period ended with a normal menstrual flow. Our examination four months after last menstruation showed the vaginal mucosa bluish, cervix softened, and uterus the size of a four months' pregnancy. Breasts were enlarged. Urine test was positive and at present there is no further doubt that the patient is pregnant.

Case 3.—A twenty-eight-year-old nullipara, married four years. No contraceptives used. Menses irregular, twenty-eight- to thirty-six-day interval, flow lasting only one day. Nephrectomy ten years ago. Thyroidectomy six years ago, basal metabolism at present is minus 28 per cent. Patient under treatment for sterility. On the twenty-eighth day of menstrual cycle patient insisted that a test be made because she somehow felt to be pregnant. The test was positive. Patient delivered exactly 280 days from first day of last menstruation.

Case 4.—A young primipara was delivered October 6, 1929; at that time she was suffering from a severe toxemia, hypertension, albuminuria, and acidosis. Since delivery her blood pressure had remained persistently above 140/86 and the urine had never become normal. She menstruated for the first time since confinement on January 6, 1930, again on February 2. The March menstruation did not appear at the expected time. Patient using contraceptives under strict instruction did not believe that she could possibly be pregnant. Urine test made on March 17 was positive. Therapeutic abortion immediately performed. Chorionic tissue found in uterus.

Case 1 represents the fairly common dilemma of differential diagnosis between fibroid and pregnancy in the elderly nullipara. In this case the clinical diagnosis of pregnancy was rendered particularly difficult through the presence of seemingly regular slight bloody discharges simulating menstruation.

Case 2 is a good example for a diagnostic difficulty experienced frequently by the gynecologist now reliably and promptly cleared up by means of the Aschheim-Zondek test.

Case 3 is of particular interest in view of the unusual early date at which the pregnancy was diagnosed. As far as we know from literature, this probably represents a unique observation.

Case 4 illustrates well the advantage, under certain conditions, of a diagnosis of very early pregnancy required in the interest of the patient.

We wish to report in this connection, that we have made tests with various commercial products which are supposed to contain the anterior pituitary hormone. Injecting into infantile female mice as much as 6 c.c. of such substances within three days we found in none of them on the fifth day any of the aforementioned three reactions supposedly characteristic for anterior pituitary hormones.

In conclusion we can state that we have confirmed the results obtained by the originators of the test; that we have found the reaction extremely sensitive and reliable; that our failures like those of other experimenters amounted to about 2 per cent, and that the so-called

anterior pituitary extracts marketed in this country do not yield in infantile mice the biologic reactions generally accepted as characteristic for those hormones.

A word will have to be said about our practice of employing only two mice for each test. Using at first four as originally recommended, we reduced the number to three and later to two for two reasons: First, because we always, possibly only by accident, found all four mice exhibited identical reactions, and secondly, because it was difficult, breeding the mice ourselves, to have always four females, not more that twenty-one to twenty-four days old, ready whenever we needed them for a test. We still believe, however, that the chances of error are definitely reduced by utilizing four mice for each test, and for this reason we have of late returned to this practice.

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THE ASCHHEIM-ZONDEK REACTION IN HYDATIDIFORM MOLE AND MALIGNANT CHORIONEPITHELIOMA

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THE recent discovery of the relationship between the anterior lobe of the hypophysis and the ovary constitutes one of the most important advances within recent years of our knowledge of the physiology of the sex glands. While this discovery is still too recent to have completely clarified the physiology and pathology of the ovary, or to have greatly influenced therapy, it has made at least one practical contribution, i.e., the Aschheim-Zondek test for pregnancy. This has been found to be a highly reliable test for growing fetal elements, and, as E. Novak says, "bids fair to become a valuable adjunct to the diagnosis of early pregnancy." On the basis of our experience with the reaction we wish to point out certain observations which may throw light on an associated feature of epithelial neoplasms of the chorion, namely, luteinization of the ovaries. We also wish to demonstrate the usefulness of the Aschheim-Zondek test as a means of diagnosis and prognosis in hydatidiform mole and malignant chorionepithelioma. The incidence of malignant chorionepithelioma following hydatidiform mole (variously quoted as 5 to 25 per cent) necessitates a guarded prognosis with a period of close observation, if not, as some have con-

tended, immediate hysterectomy. A test making it possible to detect continued chorionic proliferation in an early and operable stage is highly desirable not only because of the greater possibility of permanent cure by earlier diagnosis, but also because it would prevent needless surgery in questionable cases.

The significance of the lutein cysts of the ovary so frequently associated with cases of hydatidiform mole and chorionepithelioma has always been an interesting problem which may find an explanation in the light of our more recent knowledge of the anterior pituitary-ovarian relationship. Follicle development, while usually at a standstill during the course of a normal pregnancy as a result of the apparent inhibitory action of the corpus luteum, often progresses at a rapid rate in cases of mole and chorionepithelioma. Sections of these ovaries show many highly developed follicles which form cysts lined with proliferating epithelium undergoing lutein transformation. The luteinization process involves not only the follicle epithelium but also the stroma and has a precocious origin in the follicles themselves and before the usual stage of corpus luteum formation. The resulting cysts may become very large, Stoeckel reporting a case in which they formed a mechanical obstruction to the expulsion of the mole from the uterus.

There is considerable evidence pointing to hypersecretion of the pituitary as the cause of this condition of the ovaries: (1) Association of the cystic condition with certain tumors involving the anterior lobe of the pituitary (Wagner). (2) Its similarity to the changes produced in the ovaries of pregnant and nonpregnant experimental animals by large doses of anterior pituitary hormone (Aschheim-Zondek Reactions I, II, III). (3) The demonstration by Roessler, Zondek, Otto and ourselves that the amount of anterior lobe hormone secreted in cases of hydatidiform mole and chorionepithelioma is many times greater than during normal pregnancy. (4) The presence in the secretion of the anterior lobe of at least two hormones, one of which (Prolan A) causes follicle development, the other (Prolan B) causing luteinization of the follicle epithelium (Aschheim and Zondek).

Whether this excessive production of anterior lobe hormone is the cause or the result of hydatidiform mole or malignant chorionepithelioma is not absolutely clear. It seems likely, however, that the increased hormone production is a result of the abnormal activity of the chorion. Teel and Zondek, observing pregnant animals following injections of large doses of anterior pituitary substance, though noting intra-uterine fetal death (due, according to Zondek, to hemorrhage in the decidua and premature placental separation) did not mention abnormal proliferation of the chorion. Aschheim, Zondek and others, moreover, are of the opinion that the placenta and its elements not

only serve as a storehouse for this hormone but also play a part in its production.

The endocrine nature of the placenta has long been upheld by Halban, Frank and others on the basis of experimental and clinical evidence which seems to show that it contains and probably produces several hormones, one of these being allied through a common action upon the ovaries of immature mice with that produced by the anterior lobe of the hypophysis. Murata and Adachi in 1927 described corpus luteum formation in rabbits after intravenous injections of emulsions of placenta, hydatidiform mole and chorionepithelioma tissue. They were unaware at that time of the similar effect produced by the anterior lobe of the pituitary and concluded merely that the placenta con-

Fig. 1.—Case I. Malignant chorionepithelioma of the uterus.

tained a hormone capable of affecting the ovary. They commented upon the close similarity of their experimental results with the lutein cysts of the ovary occurring in hydatidiform mole and chorionepithelioma. A case of chorionepithelioma involving the fallopian tube reported by de Snoo showed a high concentration in the urine of an estrus-inducing hormone (Menformon). This hormone, similar to or identical with that contained in the ovarian follicular fluid, is quite distinct from that produced by the anterior lobe of the hypophysis and responsible for the Aschheim-Zondek reaction.

But few instances in which the Aschheim-Zondek reaction has been applied to cases of chorionepithelioma have been reported in the literature. To Robert Meyer and his assistant Roessler belong the credit of observing the first positive reaction from the urine of a terminal case

of metastatic chorionepithelioma. The case* has not as yet been reported in detail but has been referred to in the proceedings of the Berlin Obstetrical and Gynecological Society and in numerous writings of Aschheim and Zondek. It was found that the concentration of anterior pituitary hormone in the urine was seven times greater than the concentration usually found in the urine during normal pregnancy, 1/70 c.c. of urine sufficing to provoke a positive reaction. Two terminal cases reported by Otto showed an equally astonishing response. Otto obtained positive reactions not only with 0.3 c.c. doses of urine in a dilution of 1 to 5 but also obtained the same results with fluid extracted from the tumor as well as from small portions of the growth

Fig. 2.—Case I. Positive Aschheim-Zondek reaction seven weeks before operation. A, Luteinized follicle with hemorrhage (Reaction II). B, Atretic corpus luteum (Reaction III).

implanted in the thigh musculature of infantile mice. Fels and Schultze-Rhonhof also report positive reactions in cases of chorionepithelioma.

Zondek describes similar studies in cases of hydatidiform mole. The concentration of anterior pituitary hormone in the urine of these cases being 2 to 3 times greater than in normal pregnancy and that in the fluid of the hydropic villi being greater still. Implantation of mole tissue also gave strong positive reactions. The presence of the hormone in the urine following normal pregnancy can rarely be demon-

*The report of this case as well as of several other cases of chorionepithelioma and hydatidiform mole by Roessler (Ztschr. f. Geburtsh. u. Gynäk. 96: 516, 1929) was not available to us at the time this article was prepared for publication.

strated longer than eight days postpartum, while after hydatidiform mole it has been observed for several months. When examinations of the urine have given negative reactions, it is possible to assume cessation of chorionic proliferation.

The cases of chorionepithelioma which we are reporting to supplement those already cited in the literature have been studied by means of the Aschheim-Zondek reaction not only before the primary operation but also for some time afterward. Both patients are living and in the one case repeated negative reactions following hysterectomy and x-ray and colloidal lead therapy have corroborated the clinical findings of apparent health. In the other case the persistence of a strong positive reaction (after the same treatment) antedated the
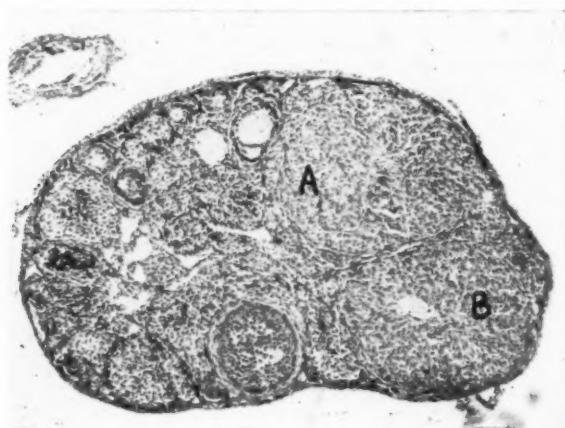
Fig. 3.—Case I. Positive Aschheim-Zondek reaction nine weeks after operation. *A.* Atretic corpus luteum (Reaction III). *B,* Atretic corpus luteum with imprisoned ovum (Reaction III).

development of two small metastases in the vagina two months after operation.

One case of hydatidiform mole showed a negative reaction (Reaction I) six weeks after expulsion of the mole, whereas another case has continued to show strong positive reactions for three months after delivery and curettage. A second curettage, performed ten weeks after expulsion of the mole because of prolonged uterine hemorrhage associated with subinvolution of the uterus, showed a well-developed decidua, hydropic villi and isolated chorionic cells in the endometrium. There was no evidence of chorionepithelioma. Examinations of the urine of this patient have continued to give positive reactions. The patient will be kept under close observation until a negative reaction rules out the possibility of a latent chorionepithelioma.*

*Urine examinations continued to give strong positive reactions for six months after expulsion of the mole. In June, the patient became pregnant and aborted spontaneously six weeks later. Further studies have not been made.

Examinations of the urines of our cases when positive showed a high concentration of anterior pituitary hormone, positive reactions being obtained in dilutions as high as 1 to 10 after six injections of 0.3 c.c. each in chorionepithelioma, and in a dilution of 1 to 5 in one case of mole.

A tumor extract prepared from Case 1 gave positive reactions in a dilution of 1 to 12. The extract was prepared by covering several large pieces of tumor tissue with physiologic saline and allowing this to stand in the refrigerator for several weeks. The fluid was then filtered and injected into infantile mice in 0.3 c.c. doses in various dilutions. Minute implants of tumor tissue also gave strong positive reactions after one hundred hours.

Fig. 4.—Case II. Early chorionepithelioma of uterus (after curettage). Lutein cysts of ovaries.

CASE 1.—This very unusual case deserves special mention because of a history of nine previous mole pregnancies, the present one terminating in chorionepithelioma. Similar case reports are rare. De Lee cites an instance of ten, Mayer one of eleven, and Essen-Moeller one of eighteen successive mole pregnancies. Le Maire and Hermont reported instances of six occurring in close succession.

Our case is of interest also for the reason that it appears to support the theory that the cause of these abnormal gestations lies in some inherent defect of the patient, probably in the ovary. This patient although married twice has never had a normal pregnancy, eight mole pregnancies occurring during her first and two during her second marriage.

Mrs. B., aged thirty-seven, was first seen in the Harper Hospital Out-Patient Department Nov. 15, 1929, with a history of amenorrhea since June 15, 1929. The marital history with regard to pregnancies was as follows:

First Husband: First pregnancy 17 years ago, miscarriage 4 mo., hydatidiform mole. Second pregnancy 16 years ago, miscarriage 5 mo., hydatidiform mole. Third pregnancy 15 years ago, miscarriage, 8 mo., hydatidiform mole. Fourth pregnancy 14 years ago, miscarriage 5 mo., hydatidiform mole. Fifth pregnancy 13 years ago, miscarriage approximately 6 mo., hydatidiform mole. Sixth pregnancy 11 years ago, miscarriage 5 mo., hydatidiform mole. Seventh pregnancy 10 years ago, miscarriage 5 mo., hydatidiform mole. Eighth pregnancy 9 years ago, miscarriage 8 mo., hydatidiform mole.

Second Husband: Ninth pregnancy 6 years ago, miscarriage 6 mo., hydatidiform mole. Tenth pregnancy present illness.

Her ninth pregnancy was associated with hypentension, albuminuria, and a transient paralysis of the tongue. ·The mole was removed by vaginal hysterotomy at Johns Hopkins Hospital, Baltimore.

Her examination on the date of admission to the Out-Patient Department showed a blood pressure of 134/70, the urine showing a trace of albumin and glucose. The uterus was enlarged to the size of a four months' pregnancy.

Aschheim-Zondek reaction *positive.*

Dec. 31, 1929. Blood pressure 154/78. The uterus had not increased in size. The patient was advised to enter the hospital because of a slight amount of vaginal bleeding.

Jan. 8, 1930. A diagnosis of hydatidiform mole was made. Hysterectomy was advised because of the history of repeated mole pregnancies. Panhysterectomy

Fig. 5.—Case II. Positive Aschheim-Zondek reaction three days before operation. *A,* Luteinized follicles (Reaction II). *B,* Ripening follicle (Reaction I).

was performed, removing entire uterus and both adnexa. Uterus shows typical chorionepithelioma. (See Fig. 1.) There was no evidence of visceral metastases.

Pathologic diagnosis: "Malignant chorionepithelioma with extensive invasion of uterine wall."—P. F. Morse, M.D.

Jan. 7, 8, 19, 1930. Aschheim-Zondek reaction *positive.*

Jan. 23, 1930. Patient discharged in good condition after x-ray and colloidal lead therapy. Uneventful convalescence.

Feb. 17, 1930. Aschheim-Zondek reaction *positive.*

March 4, 1930. Surgical removal of two small metastases in the anterior vaginal wall. Fifty mg. radium implanted in surgical field for eight hours after operation.

March 7-13, 1930. Deep x-ray therapy. Discharged in good condition.

March 9, 1930. Aschheim-Zondek reaction *negative.* (Reaction I.)

March 15, 1930. Aschheim-Zondek reaction *positive.*

Further studies could not be made since the patient left the city and could not be traced. We assume that she has not been permanently cured.

CASE 2.—Mrs. D., aged thirty, entered Harper Hospital as a patient of Dr. Geo. Kamperman, Dec. 3, 1929, because of profuse uterine bleeding which had begun six weeks previously when she was about four months pregnant. Her last menstrual period was July 18, 1929. Clots of blood and pieces of brown tissue were expelled from the vagina before admission to the hospital. Curettage was performed on the diagnosis of incomplete abortion.

Examination: Essentially negative. The cervix was widely dilated and what appeared to be placental tissue protruded from the external os. A large amount of tissue was removed by curettage. There was no further bleeding.

Pathologic Diagnosis: ''Chorionepithelioma malignum.''—P. F. Morse, M.D. Subsequent examination of the remaining tissue removed by curettage revealed hydropic placental villi, pointing to hydatidiform mole as the origin of the chorionepithelioma.

Fig. 6.—Case II. Negative Aschheim-Zondek reaction three months after operation. A, Ripening follicles (Reaction I).

Dec. 7, 8, 1929. Aschheim-Zondek reaction *positive.*

Dec. 10, 1929. Panhysterectomy performed removing both adnexa and entire uterus. There was no evidence of visceral metastases. (See Fig. 2.)

Dec. 27, 1929. Aschheim-Zondek reaction *positive.*

Jan. 3, 1930. Intravenous injection of colloidal lead followed by deep x-ray therapy. Discharged after uneventful convalescence.

Jan. 2, 1930. Aschheim-Zondek reaction *negative.* (Reaction I.)

March 4, 9, 1930. Aschheim-Zondek reaction *negative.* (Reaction I.)

CONCLUSIONS

1. The amount of anterior pituitary hormone excreted in cases of hydatidiform mole and malignant chorionepithelioma is greater than that excreted during normal pregnancy.

2. The anterior pituitary hormone is an etiologic factor in the formation of lutein cysts of the ovary.

3. The Aschheim-Zondek reaction is an important diagnostic and prognostic aid in cases of hydatidiform mole and malignant chorionepithelioma.

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MUSIC IN THE OPERATING ROOM

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WHILE the discovery of ether and chloroform anesthesia revolutionized surgery, they have never been entirely satisfactory anesthetic agents. Chloroform, on account of its dangers, is now seldom used, even in obstetrics. Ether, while a relatively safe anesthetic, is objectionable on account of the distress incident to its induction, the postoperative nausea, vomiting, headache and pulmonary irritation. Many methods to avoid the distress of induction have been tried but none have been entirely satisfactory. The preanesthesia dose of morphine and scopolamine, with gas induction, and the modern methods of administration have lessened the terrors of ether but have not entirely eliminated them. Again ether is not a satisfactory anesthetic for the operator in operations about the head and face, chest and abdomen. The failure to obtain complete relaxation of the abdominal muscles and quiet intestines makes what should be an easy abdominal operation, in many cases, a difficult one.

It is not strange in working under the disadvantages of ether and chloroform anesthesia that operators, from time to time, took up with avidity some newly proposed form of anesthesia. We have witnessed the advent and passing of many methods. Some were of such inherent value as to remain in more or less general use. Some, while of undoubted value, were, technically, so difficult of correct application as to make them impracticable.

We recall the great impetus spinal anesthesia received from Jennesco's visit and how quickly it was condemned as its dangers were realized. Instead of being an anesthetic of choice it soon became the method of special indications. A few operators, particularly W. Wayne Babcock, persisted in its use, improving the technic until in their hands it became a relatively safe anesthetic. Recently others have taken up the work of the pioneers and, as the result of the work of Pitkin, Labat and others, spinal anesthesia has become so popularized as to put all other forms of anesthesia in the background. Improved technic and anesthetic agents have undoubtedly lessened its dangers but not eliminated them. We use it routinely in all abdominal operations, except for uncomplicated appendicitis, and in all combined plastic and abdominal sections. It hardly seems proper, to me, to risk spinal anesthesia for an operation to remove an appendix which can be done in a comparatively few minutes under gas, ethylene or local anesthesia. Nor do I think it wise to use it in ordinary plastic operations where relaxation is not required and which can be done safely and expeditiously under other forms of anesthesia.

In our clinics we are enthusiastic advocates of spinal anesthesia. No other type of anesthesia gives the relaxation, exposure and quiet intestines in abdominal operations. Operations which are difficult under inhalation anesthesia become easy of execution. The time of operation is shortened, the intestines and peritoneum are less handled and traumatized. The condition of the patient after operation is striking compared to the postoperative distress of the average ether patient. Seldom do gas pains, ileus, nausea, cough or headache distress the patient. To work with it and to see the comfort of the patient after operation is bound to make one an enthusiastic advocate. The picture, however, is not as flawless as painted. There are disadvantages yet to overcome in its administration and it is still more dangerous than ether. I am satisfied that, when our enthusiasm has waned and we are in a state of mind to become judicial, spinal anesthesia will fall from its present high estate and again become the agent of special indications, with the field of indications greatly broadened. Since the first of the year we have had the following experiences that have somewhat tempered our enthusiasm. Two patients received preliminary injections of morphine and scopolamine one hour prior to operation, one a hysterectomy for fibroid tumor of the uterus, the other for old pelvic inflammatory disease. The site of the injection was anesthetized with novocaine 1-200 to which was added ephedrin and neocain in one case, and novocaine in the other, dissolved in withdrawn spinal fluid and reinjected into the spinal canal. Operations were completed without difficulty and with no complications. The patients left the table in excellent condition and remained so for ten

hours when they suddenly became pulseless and it was impossible to record a blood pressure. Peripheral circulation entirely disappeared and the patients were in desperate condition for forty-eight hours, until circulation was reestablished. Whether the condition was due to spinal anesthesia or the late effects of ephedrin, I do not know. Opinions on this point differed with my colleagues who came to my aid in caring for these patients. Two deaths, one in the hands of my first assistant, the other with my colleague, have occurred under exactly similar circumstances. In both the operations, combined plastic and sections lasting nearly an hour, when the effects of the anesthetic wore off it was necessary to give nitrous oxide to complete the operations. After a few inhalations of nitrous oxide and oxygen, death resulted suddenly. What caused death in these two cases I do not know, but spinal anesthesia must bear the larger share of suspicion.

In addtion to its inherent dangers spinal anesthesia in common with local anesthesia has the disadvantage of the patient's being conscious and cognizant of what is happening. This statement is, I know, only relatively correct because it is possible with the use of morphine and scopolamine, avertin or sodium amytal to either obtund the senses or even induce deep sleep. There are several objections to these agents. We have had frequent experiences with wild delirium following the second injection of morphine and scopolamine so that it was impossible to give spinal anesthesia and it was necessary to resort to gas and ether sequence. We have had the same experience with amytal. Secondly, we consider it a dangerous practice to have the patient unconscious during spinal anesthesia. If any of these agents are given in sufficient dosage to induce unconsciousness a dosage can be so graded as to make it unnecessary to give any other anesthetic agent. At one time I was quite enthusiastic and reported a large number of operations done under morphine and scopolamine.

" It was for the reasons of unpleasant reactions from drugs and the fear of complete loss of consciousness when using spinal anesthesia that led me to look for some method that would obviate these objections and allay the fears of the conscious patient. Anything which would appeal to the senses sufficiently to keep the minds of the patients occupied would divert, from them, the thought of operation. Music best fulfilled the requirements." It did not in any way interfere with the rigid operating room technic and its motif could be changed to suit the taste of the patient. Again we were not dealing with an unknown experience. Music has been used from untold ages during operations and childbirth, not to scare away the devils, but to divert the mind of the sufferer from torments of fear and pain. Many operators in modern times have and do use music in the operating rooms. Donald Guthrie, of Sayre, has music played preliminary to and

subsequent to ethylene anesthesia. A number of hospitals have added the radio to their operating-room equipment to be used as an adjuvant to local anesthesia in tonsil operations on children.

· We have been using music for a year and have been well satisfied with the results and feel that it is a valuable addition to the operating room.

· There is a growing tendency to consider the psychology of the patient's fear of all that relates to the hospital. As a result the newer hospitals are planned to eliminate the hospital atmosphere and stress the apartment or hotel atmosphere. This idea is well carried out from the time the patient enters the front door until she reaches the operating suite. It is true that the sensibilities are somewhat deadened by a preliminary injection of a sedative, but they are still acute enough to be thoroughly aware of the nature of the surroundings. The one place that hospitals have neglected to modernize is the operating room. The patient on reaching the operating suite feasts her eyes on the surgeons and assistants parading garbed as for a barbecue, while they listen to the jingle of the instruments and basins, the hiss of escaping steam, and the cries of a child fighting his anesthetic. I know that these conditions do distress patients and, in many cases, cause such a panic of fear as to affect the patient for months after she has left the hospital.

When we first started using music we thought of it only in connection with local and spinal anesthesia. We now recognize its value in :

· A. Creating a better atmosphere for all patients coming to the operating suite. Patients are greeted with music and the usual noises of the operating room are not heard. (In addition we have adopted the custom of wearing a linen coat over the operating suit and discarding masks and caps while actually outside the operating room.)

· B. Diverting the attention of patients in operations under local and spinal anesthesia.

· C. Relaxing the tension of the operator and operating room personnel during operations.

D. Entertaining the operating suite force during the arduous tasks of cleaning up, and preparations, after the work of the day is finished.

It is hardly necessary to discuss A. It is self-evident that any agent which will allay the fear and often terror of the patient on coming to the operating room and will make the minutes which seem like hours, while awaiting operation, pleasant instead of a nightmare of horrors, is of great value. Music does this.

B. We now give one dose of morphine and scopolamine thirty minutes before the scheduled time for operation. We rarely see any ill

effects from scopolamine by this practice, but the patients are fully conscious and aware of what is occurring. The spinal injections are made painless by the preliminary injection into the skin and ligament of 1-200 novocaine. We have had a few patients, in a fairly large series, object to the music. These were of the highly hysteric type and who were not really suited to spinal anesthesia. The majority of patients enjoy the music and it is not an unusual experience to hear them humming a familiar tune. I have heard a patient singing loudly while a forceps extraction was being done. There is no question that the patients are better for the lack of psychic shock and lessened pre-anesthetic drugging.

C. The first case in our experience was one of those densely adherent old inflammatory cases that ruins the surgeon's reputation for equanimity of disposition. In this case, as is usual in cases of this character, everything went wrong: gloves tore, catgut broke, knives and scissors were dull, forceps would spring, but strange to relate the assistants were fine boys and the nurses were angels. This relaxation of tension was to me a remarkable demonstration of the old saying that "music hath charms to soothe the savage beast." The reaction to music must be individual but it has made my operating room a pleasanter place to work for myself and those who work with me.

D. The idea of music to entertain and to lighten the burden of work is not new. The reader in the tobacco factories in Cuba is an old and familiar sight. The boats of the Mississippi have been laden to the crooning of negro melodies and the great transcontinental railways were built to the tune of "Drill, ye tarriers, drill." Many large manufacturing plants where the labor is monotonous in character now use music to divert the mind of the worker from the task in hand. The nurse in charge of the operating room tells me that the nurses are happier in their tasks, and that the work is speeded up and more work is accomplished with less tiring, with the music, than prior to its use.

It soon became evident that there must be at command a constant source of the kind of music wanted. This ruled out the radio. We also found that for practical purposes a continuous source of music must be available. It would not be practicable to assign a nurse to change records. Good production is also essential. To supply these requirements a special self-playing automatic record-changing instrument with a superior type of reproducer* has been constructed.

The next and most interesting problem was to find the type of music suitable. We nearly wrecked the study in its incipiency by trying to adapt the type of music to the character of the individual. The first few patients were of the dancing, flapper type and we soon found that, while they like jazz at the roadhouse, it had no place in the

*The Victor Talking Machine Company has developed and constructed this instrument.

operating room. Sentimental music must also be avoided. We found that soft, soothing melodious music is the kind most acceptable to all patients.

When we first introduced music to the operating room we were the victim of a good deal of good-natured and, at times, acid raillery, but many who joked are now enthusiastic as to its value.

There is nothing new or revolutionary in the idea here presented. It is but another step forward in the modern thought that all medical and surgical procedures be shorn of physical and mental suffering.

1900 RITTENHOUSE SQUARE.

THE IMPORTANCE OF UROLOGIC INVESTIGATIONS IN GYNECOLOGIC PATIENTS*†

BY ISADOR W. KAHN,‡ M.D., F.A.C.S., AND ROBERT B. WALKER,‡ M.D., NEW YORK, NEW YORK

MOST patients who consent to an elective gynecologic operation or submit to palliative measures directed to the female organs have a right to expect that such measures will either relieve or cure the symptoms for which these procedures are advised. Over a period of years, we have been impressed more and more by the number of patients reaching our hands, either at the clinic or in private practice, with symptoms persisting after operation or after prolonged therapy. These observations led us to carry out the investigations we herewith outline. In the cases in which operative procedures had been resorted to, the desired anatomic result was obtained in most instances. The end-results of plastic operations on the perineum, for cystocele, and for uterine prolapse were beyond criticism. In a number of cases, however, various organs had been sacrificed. The symptoms of which these patients complained were those familiar to the gynecologist: sacral or lumbar backache, urinary disturbances, suprapubic discomfort, pelvic dragging, lower abdominal distension, etc.

Because of the close association of the urinary tract with the female pelvic organs, we deemed it advisable to make a detailed urologic study of every patient who presented herself with such symptoms persisting after operation or after palliative treatment, such as vaginal packings, douches, diathermy, foreign protein injections, etc. Most of the patients had been discharged from other institutions as cured, and were so recorded. Although many of the operative results were entirely satisfactory from the corrective standpoint, they were one hundred

per cent failures so far as symptomatic relief was concerned. On Dr. Dannreuther's service a preoperative study of the urinary tract is carried out on practically all candidates for elective operations.

In this series, 169 patients were studied. Some of these had been admitted to the gynecologic clinic and then referred to the female cystoscopic clinic; others came under observation in private practice. Those admitted to the gynecologic dispensary had a careful history taken and were then subjected to a complete pelvic examination. This included every available diagnostic aid to insure a correct diagnosis. On its completion, the patient was referred to us for a urologic investigation. The female cystoscopic clinic is an integral unit of the gynecologic service, and an atmosphere of hearty cooperation prevails at all times.

Our investigation included the following details:

1. Inspection of the external genitals, with special attention directed to evidence of skenitis, urethral caruncle, prolapse of the urethra, cystocele, and uterine prolapse.

2. Notation of relaxation of the vesical sphincter, manifested by the dribbling of urine on coughing, straining, or exertion.

3. Macroscopic inspection and microscopic study of catheterized specimen of urine.

4. Cystoscopic investigation, with particular attention to its capacity, tolerance, contour, mucosa, urethro-vesical junction, trigone, and ureteric orifices.

5. Indigo carmine test for renal function.

6. Ureteral catheterizations, doing each side at a separate sitting.

7. Culture of the urine specimen from each kidney.

8. Pyelogram, ureterogram, or cystogram, as indicated.

We have not been satisfied to explain urinary frequency on the basis of a cystocele alone. We have not felt that a retroversion of the uterus, with the cervix displaced anteriorly under the pubic arch, completely explains a patient's bladder disturbance. In several such cases, seen by us after a corrective operation, the patients experienced the same annoyances that existed before operation, and it was only after a complete urologic investigation and the discovery of pathology in the urinary tract that the true etiologic factors were revealed.

Of the 169 cases, 59 had been operated upon previously for:

Appendix	12
Gall bladder	7
Uterus	13
Tubes	7
Ovaries	6
Pelvic floor	5
Cystocele	9

Our study also included 81 cases on Dr. Dannreuther's service at the Post-Graduate Hospital in which an elective operation on the female pelvic organs had been recommended. In this group, 29 had been treated elsewhere previously without relief. The patients found to have definite lesions of the urinary tract requiring surgical attention, were referred to the urologic department. It is interesting to note that 12 had both pelvic and urogenital pathology. Some of our patients had suffered as long as 15 years with the same symptoms, only to be relieved after the institution of treatment directed to the urinary organs. Negative cases were sent back to the gynecologic clinic for advice and treatment. Of those patients who had definite pathology in the urinary tract, 6 had stones in the kidney or renal pelvis; 1 had a huge stone in each kidney; 4 had pyonephrosis; 3 hydronephrosis; 5 renal ptosis; 29 pyelitis or pyelonephritis; 6 ureteral dilatation; 7 ureteral stricture; 1 a double ureter with stricture; 1 a diverticulum of the bladder; 3 intravesical newgrowths; 2 foreign bodies in the bladder; 12 ureteral caruncle; 3 prolapse of the urethra, and 2 had urethral stricture.

A few case reports illustrating the object of this paper might be of interest:

CASE 1.—Mrs. F. K., 31 years of age, came complaining of dull pain in the back along the right side; she also had dull pain in both lower abdominal quadrants, aggravated by exertion, on the right side. She had been suffering from this condition for about two years. Her right tube and ovary, as well as the appendix, had been removed one and one-half years before with no relief of symptoms. Cystoscopic examination revealed the following: bladder capacity normal; mucous membrane moderately congested; the right ureteral orifice congested and dilated; function sluggish. The left ureteral orifice was fairly normal. Trigone was edematous, cystic, and hemorrhagic. The vesical neck presented nothing abnormal. Our impression at this time was that we were dealing with a chronic cystitis cystica and, from the appearance of the right ureteric orifice, we felt there was pathology above. The right ureter was subsequently catheterized and a markedly turbid specimen obtained with abundance of shreds, flakes, and débris. Microscopically, there was an abundance of pus. The indigo carmine test showed that the dye was eliminated from the left side in 12 minutes, and the right side in 14 minutes. The right ureter was again catheterized about a week later and about 60 c.c. of urine was drained in a very short time, suggesting a hydronephrosis. The patient was next subjected to a pyelographic study of both kidneys and ureters, this investigation being done separately on each side after an interval of 3 days. The x-ray report showed the left kidney to be normal in shape, size, and position. The right kidney was enlarged and a contrast substance in the right renal pelvis showed a marked dilatation and blunting of the minor calyces. The x-ray diagnosis was marked dilatation of the right kidney pelvis with probable pyelitis. Her right renal pelvis was lavaged 6 or 7 times at intervals of 5 days. The indigo carmine test after 2 months showed a healthy elimination of the dye in 6½ minutes from the right side, and in 3 minutes from the left.

CASE 2.—Mrs. R. B., 36 years of age, was referred to us for pain in the left groin radiating to the left ovary. She had been suffering from this for several months and was treated medically and gynecologically without relief. Upon cystoscopic examination we found the following: capacity normal, as well as tolerance

and contour; the mucosa generally reddened and thickened, with several scattered hemorrhagic areas. The right ureteric orifice was markedly congested, elongated and dilated, the left ureteric orific embedded in a mass of hyperplastic tissue and cystic nodules. The findings around the left orifice were highly suggestive of pathology higher up. The trigone was edematous and covered with a mucous film. The neck was negative. The left ureteric orifice was catheterized and obstruction met about 3 inches from the vesical orifice. The indigo carmine test showed a good elimination from both sides in two minutes. A pyelogram was done subsequently with an x-ray catheter in the left ureter; the catheter was found to be in contact with an oval-shaped dense deposit opposite the ischial spine on the left side. This deposit appeared to be a low ureteral calculus. The contrast substance was then injected and showed a fusion of a contrast medium obliterating the calculus. The upper ureter was slightly tortuous in its course and somewhat dilated. There was rather marked dilatation of the kidney pelvis on the left side. On close examination of the x-ray film, on the right side several small granular deposits were found in the central region of the right kidney, evidently calculi. Our diagnosis in this case was oval-shaped calculus in lower part of left ureter with dilatation of the left kidney pelvis, as well as several small calculi in the right kidney.

CASE 3.—Mrs. M. C., 42 years of age, complained of sharp recurrent pains in the right loin and lower abdomen for one year. She also experienced sharp pains on voiding, as well as nocturnal and diurnal frequency. She had had appendix, and right tube and ovary removed 8 years prior to this. Gynecologic examination was negative except for a cystic cervix. Cystoscopic examination gave the following findings: capacity and contour normal; the mucosa markedly hyperemic; distinct double opening on the right side of the bladder which appeared as a double ureter; the superior opening was smaller than the inferior. A No. 5 catheter passed easily into both ureters and cloudy urine was obtained from both. Indigo carmine test showed elimination of the dye from the left ureter in 15 minutes, and from both openings on the right side in 11 minutes. A pyeloureterogram was done with catheters introduced into both ureteral openings on the right side. Examination was also made with contrast injection of the right side, and showed a double ureter with a small pelvis and somewhat blunted calyces in the upper pole and a rather large kidney pelvis with three main calyces in the central and lower area; the left kidney was of normal shape, size, and position. The patient had both ureteral openings catheterized at 5 to 7 day intervals as well as 5 per cent neo-silvol instillations to the kidney pelves and took pyridium, 2 tablets three times a day by mouth. She responded very promptly to this treatment and was cleared of her infection after two months. Our final diagnosis was: double ureter and rudimentary superior pelvis with large normal pelvis on the right side; as well as chronic pyelitis.

CASE 4.—Mrs. M. J., 28 years of age, presented herself to the gynecologic clinic suffering from frequency of urination, and sharp recurrent pains in the right loin. For the past 4 years she had had periodic attacks of pain in the left loin, which radiated along the course of the left ureter. She had had a previous appendectomy and also a left tube and ovary removed. She was examined once by a physician during an attack of pain in the left loin and he made a clinical diagnosis then of renal calculus. Following an attack 6 months ago the patient had a pyelogram done at a hospital in Jersey and the x-ray report was negative. A few months later another pyelogram was done at another hospital in Jersey also with negative findings. She finally came to the Post-Graduate O.P.D. gynecologic clinic, where a gynecologic survey was made and the report showed no pathology. She was then referred to the female cystoscopic clinic where a routine bladder and kidney exam-

ination was done. The left ureter was catheterized and a purulent specimen was obtained which contained numerous small granular flakes and débris suggesting a chronic pyelitis. She was promptly treated for this condition, and was greatly improved both symptomatically and otherwise after a few weeks.

CASE 5.—Mrs. H. P., 25 years of age, consulted us for sharp pains in the left lower abdomen, which she had for about 2 years. Gynecologic examination was negative. Cystoscopic examination revealed a generally hyperemic bladder. The left ureteral orifice was congested and function was good. The right ureteral orifice showed moderate inflammation, was dilated, elevated, elongated, and the function was poor. An indigo carmine test showed elimination of the dye from the right ureter in 15 minutes, and from the left in 5 minutes. A pyelogram showed the kidneys of normal shape, size, and position. A spherical shadow of somewhat irregular structure measuring over a quarter of an inch in diameter, was seen in the central pelvic region of the right kidney; the contrast substance injected showed a moderate pelvic dilatation with an S-shaped twist at the uretero-pelvic junction. A culture of the urine yielded a pure culture of bacillus coli on the right side. Final diagnosis: calculus of the right renal pelvis with infection.

CASE 6.—Miss M. W., 17 years of age, complained of sharp pains on voiding for over 10 months; she also had sharp recurrent pains in the back and over lower abdomen. She was a virgin and had refused pelvic examination both at our hospital and alsewhere. Upon cystoscopic examination there was found a distinct obstruction at the vesical neck, and when a Furniss metallic catheter was passed to fill the bladder, a distinct stone-like click was experienced. With a Nitze examining cystoscope a large spherical-shaped stone, grayish white in color, was seen obstructing the greater part of the vesical neck. A cystogram showed a large oval-shaped calculus about 2½ inches long in the bladder with a large hairpin embedded therein. Patient was operated at the Post-Graduate Hospital, and stone and hairpin removed by Dr. Clarence G. Bandler. Final diagnosis: large calculus of the bladder with a foreign body embedded in the calculus (hairpin). This patient, prior to our first seeing her, had been treated medically as well as by physiotherapeutic measures without relief.

CONCLUSIONS

Many patients with gynecologic symptoms often suffer from pathologic conditions of the female urinary tract.

Failure to examine the urinary organs often results in a needless sacrifice of such organs as the gall bladder, appendix, fallopian tubes, ovaries, or uterus.

The indigo carmine function test is a helpful adjunct in preoperative examination of gynecologic patients. It gives a quick and approximate idea of the surgical competence of the kidney and so helps to prevent the development of postoperative, unrecognized uremia.

All gynecologic patients should be cystoscoped before any elective gynecologic operation is done.

801 WEST END AVENUE.

CYSTITIS EMPHYSEMATOSA*

V. A Case in a Woman in Which Trauma Appeared to Be an Etiologic Factor

By Ralph G. Mills, M.D., Fond du Lac, Wis.

TRAUMA has entered into the history of several of the cases previously reported. The patient in Case 2 was repeatedly examined with a cystoscope, and a tumor of the bladder was fulgurated. Ureteral catheterization was performed in Case 4, and several cystoscopic examinations were made. An hypertrophied prostate gland had been removed from the patient in Case 8 one year before, and a catheter was used shortly before his death. In Case 6 there was an area of hemorrhage in which vesicles occurred. The area was similar to that shown in Fig. 1 of this article. At the time Case 6 was reported the full significance of this area was not appreciated. This patient was catheterized six days before her death, at which time 1100 c.c. of urine was withdrawn. The condition of cord bladder was probably relieved by the catheter several times before her death ensued. A catheter was employed within six days of death in Cases 3, 5, 10, and 12 (the case reported here). In Case 11 catheterization was ordered six days before death, but it is not recorded that it was carried out. In the remaining cases, Cases 1, 7, and 9, there is no record of catheterization, but it probably was done because of the comatose condition of the patients.

The clinical and hospital records in each case were studied to discover evidence as to whether a catheter had been used during the patient's illness. This was found to be unsatisfactory, as note was frequently not made of this procedure. Care given as a routine in hospitals differs slightly, but in general a patient is not allowed to exceed eight hours without voiding or having the catheter used. The nurse's notes frequently did not state the manner in which a given specimen of urine had been obtained. Fortunately in the case reported here, Case 12 of the series, the records had been more carefully kept, and presented evidence that was conclusive.

CASE 12.—A woman, aged seventy-six years, registered at The Mayo Clinic the last time, December 28, 1928. She had been at the clinic on several previous occasions, the first time in 1913. At this time she had been suffering with urethral caruncle and a chronically irritable bladder. Cystoscopic examination had been made, and the mucosa of the bladder had been found to be markedly inflamed.

The patient returned April 16, 1927, and was operated upon for chronic chole-cystitis and cholelithiasis; the gall bladder and common bile duct were opened for the removal of a stone in each. A year later, acute pains began in the upper por-tion of the right quadrant of the abdomen, lasting for two days. Two weeks before the last admission these pains returned, associated with chills, fever, vomiting, and later, jaundice.

During the examination, rigidity of the abdomen and a palpable mass in the upper portion of the right quadrant of the abdomen were demonstrated. The serum contained bilirubin to the extent of 10 mg. in 100 c.c.; the van den Bergh reaction was direct. The concentration of blood urea was found to be 68 mg. and creatinine 3.4 mg. in each 100 c.c. The urine was purulent.

Fig. 1.—Gross appearance of the bladder. The drawing was made from a photo-graph taken of the fresh specimen, and corresponds with a description written at the same time that the photograph was made.

January 2, 1929, cholecystotomy was again performed and the gall bladder, which was distended with 300 c.c. of brownish fluid mixed with pus, was emptied. Two small stones were found. Owing to the presence of acute infection, and the high concentration of blood urea, it was not considered advisable to open the com-mon bile duct.

During the postoperative period of three days, the concentration of blood urea rose to 181 mg. in each 100 c.c., and signs of bronchopneumonia developed. The bladder was catheterized the day after operation. The amount of urine withdrawn was 400 c.c., the reaction was acid, and the specific gravity was 1.010; the urine contained albumin graded 2, granular casts graded 2, and pus graded 3, with about 30 pus cells in a low-power field. The following day the amount of the catheterized specimen was 475 c.c., the reaction was alkaline, and there were about 18 pus cells

in a field. On previous occasions, in voided specimens, a few erythrocytes were discovered. Glucose solution, 20 per cent, was given intravenously on several occasions. Death occurred early the next morning.

Necropsy was performed three hours after death on the unembalmed body. Two small stones were found in the common bile duct producing obstruction and jaundice. Local suppurative pylephlebitis, bronchopneumonia, bilateral ureteropyelitis and cystitis emphysematosa also were found.

The mucosa of the bladder was slightly yellow and was markedly hyperemic. Grossly the mucosa was normal in structure except at two places (Fig. 1). These were on the posterior wall about 5 cm. from the urethral opening; one was directly opposite the orifice, and the other about 1 cm. to the right. Both were about 1 to 1.5 cm. in diameter. The one in the middle was slightly more hemorrhagic than the one on the right. The former contained a group of rather large, gas-
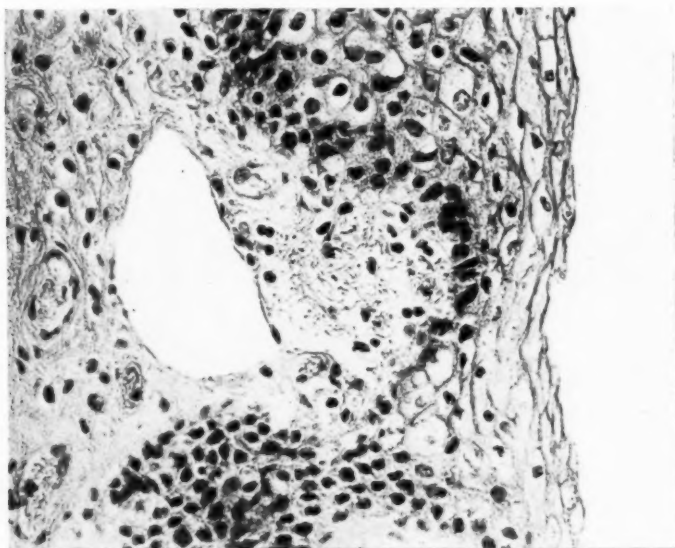
Fig. 2.—A lymphatic vessel, distended with gas, lying just below the surface of the bladder which is still covered by an intact layer of epithelium. Between the two is a mass of bacteria, which apparently has not invaded the lymphatic vessel. ×300.

filled vesicles in the submucosa, varying in size from 2 to 3 mm. There were about twelve of these vesicles. The area on the right side contained about half that number, each of which was slightly smaller than those in the middle area. The wall of the bladder was somewhat thickened in these regions, corresponding to the amount of projection of the lesions into the lumen. Other portions of the bladder appeared to be normal.

The microscopic appearance of the structures in this case conforms in general to the description of the changes in the bladder in Cases 7, 8, 9, and 10, which have been reported previously. The details given here will, therefore, deal chiefly with the features of special interest wherein elucidation of moot points has been facilitated. The epithelial layer was lost over the lesions, but was relatively unaffected at the edges, where there was no evidence of inflammation. The spread

of organisms into this area is shown in Fig. 2, in which a mass of bacteria lies beneath the intact epithelium. A lymphatic vessel, distended with gas, lies immediately beneath it. Bacteria were not observed in the lymphatic system. Inflammatory reaction was noted near the center of the lesions (Fig. 3); the leucocytic infiltration was below the surface rather than involving the lining membrane of the lumen. Distribution of the cellular collections was irregular; some portions were heavily infiltrated, whereas others were entirely free. This patchy distribution is shown in Fig. 4, in which the collections lie about a lymphatic vessel. In the center of the figure, also, is shown a lymphatic vessel filled with coagulated material in which a few leuco-
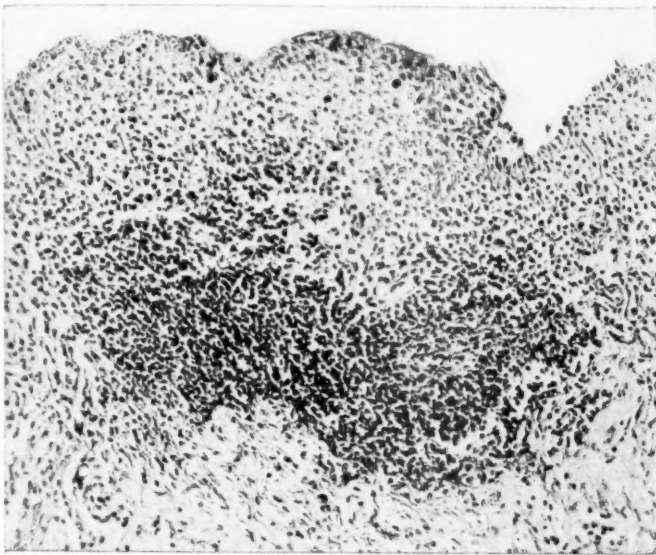
Fig. 3.—A focus of inflammatory tissue lying a little below the surface of the bladder (above). The intervening structures show very little change. The epithelium has been lost. ×175.

cytes appear. No actual injury was discovered in this lymphatic vessel, in spite of the abundant perivascular infiltration. In another section, however (Fig. 5), a hyalin mural thrombus was found in a lymphatic vessel. This was not associated with localized infiltration or with other evidence of inflammation in the region.

The lymphatic channels in other portions of the lesions, in addition to the one shown in Fig. 2, suffered by distention (Fig. 6). The former endothelial lining of the lymphatic vessels has degenerated, as shown by the dark-colored masses that line the spaces. These chromatine masses have been observed before, but their relation to the lymphatic vessels was never so clearly demonstrated. Giant cells have been said to arise from degenerated endothelial cells, but I found no

evidence in this case to support the contention. Individual nuclei cannot be distinguished, and the chromatine seems to be undergoing dissolution.

The blood vessels in these sections were affected both by acute and by chronic types of injury. The latter are probably sufficiently explained by the advanced age of the patient. Fresh thrombi occasionally were seen, more or less obstructing the flow of blood. In a few areas of chronic inflammation, evidences of obliterative endarteritis and organized thrombi were observed. Hemorrhage entered prominently into the picture, as presented grossly (Fig. 1), and as observed microscopically in many sections. In Fig. 7 is shown a vesicle contain-

Fig. 4.—A distended lymphatic vessel lying near the surface of the bladder (above) and a vesicle just below the limits of the photograph. The lymphatic vessel contains coagulated lymph, in which are a few leucocytes. It follows a devious course, and there is cellular infiltration about it. ×225.

ing clotted blood; the clot is broken up by gas bubbles. Layers of fibrin appear on the walls lining the cavity, suggesting the intermittent character of the bleeding. Most of the vesicles were perfectly clear and were filled only with gas.

COMMENT

It had been suspected, in the study of reported cases, that the element of trauma might have been significant in the induction of cystitis emphysematosa. Cystoscopic examination and the manipulations involved in ureteral catheterization were thought of sufficient moment to produce minute, or possibly more gross, injury to the mucosa of the bladder. In one instance a small papilloma within the bladder had

been removed by fulguration. It is conceivable, also, that other forms
of injury, such as the passage of a stone, over-distention, exploration
of the bladder during laparotomy, or possibly transmitted injury
through falls or blows, might also be potent forms of injury. These
would all be relatively rare as etiologic factors, whereas catheteriza-
tion is commonly performed, and usually is considered a harmless pro-
cedure.[6] In this case, the peculiar situation and appearance of the
lesions created an impression that the catheter had been responsible
for the initiation of the disease. This was thought to be more than a
hypothesis when in the history was found the record that catheteriza-
tion had been done on two successive days immediately preceding the
death of the patient.
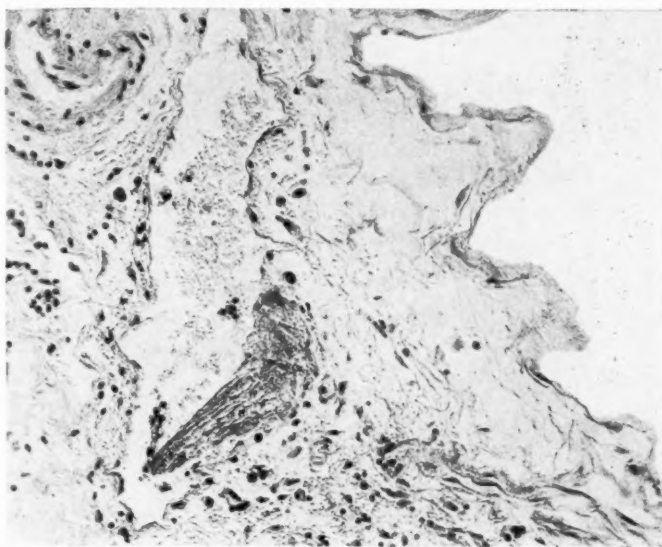
Fig. 5.—A large lymphatic vessel parallels the wall of a vesicle, which is the open
space on the right side. On its wall has formed a hyalin thrombus that does not
include cellular elements within it, and they are also absent in the adjacent tissues.
Edema is prominent in this region. ×175.

The gross appearance, as well as details determined in microscopic
sections, showed that the middle lesion was undoubtedly older than
the one a little to one side. This would correspond with the history
of catheterization on two successive days. The appearance of the two
lesions, with a presumed interval of a day between, would strongly
suggest the rapidity with which vesicles may form in a given place.
However, a comparison of the area involved in this case, with those
illustrated in other reports, suggests that for the disease to spread over
the entire organ would require several days at least. If this reasoning
is sound, the inference is justifiable that although cystitis emphysem-

atosa may develop during the last days of life, at least it is an intra vitam process, and not a postmortem phenomenon. How long before death it may develop, or whether it may occur in a relatively healthy person, remains to be demonstrated.

The mere passage of a catheter into a bladder, even if the tip should impinge on the opposite wall, does not of itself produce cystitis emphysematosa. If it did, cases in which this lesion develops would be common instead of relatively rare. The presumption is that conditions of some sort must be right to permit a trivial injury to the mucosa to initiate the lesion. Presumably this would include the presence of a certain type or types of bacteria, possibly with lowered local resistance.
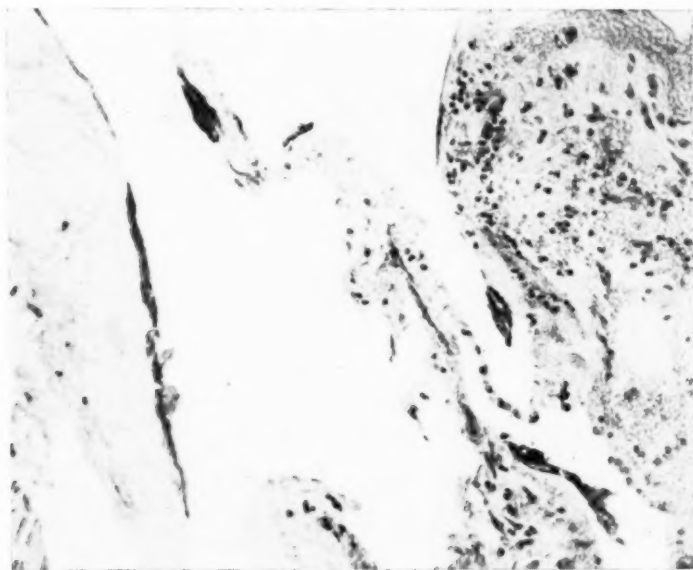
Fig. 6.—The endothelial lining of a large lymphatic vessel undergoing early degeneration. The nuclei in these deeply staining masses are indistinguishable, but there is little doubt as to their identity. It is doubtful if such cells could give rise to giant cells by nuclear division. ×150.

Bacteria undoubtedly enter the bladder much more frequently than is commonly appreciated. Bacteria have been found repeatedly in the urethra of both males and females far above the meatus, and the introduction of any instrument, the catheter included, tends to carry them farther up the urinary tract. Baisch found that in women who were confined to bed, and were allowed to urinate only twice in twenty-four hours, Escherichia coli could be cultivated from the urethra within five days. The multiplication of urethral bacteria was inhibited by increasing the frequency of urination and the total quantity of urine. It is reasonable to suppose, then, that if a patient, especially a woman, were confined to bed, and perhaps in a serious physical condition, her

bladder would be more exposed to the invasion by vaginal and urethral bacteria than if the patient were able to walk about. Jansen observed that cystitis was less frequent among patients who got out of bed early, than among those who were longer confined. All of the patients whose records have been detailed have been in such serious condition during the last few days of their lives as possibly to predispose them to the development of this form of disease of the bladder.

Very few efforts have been made to determine the extent of injury to the bladder produced by catheterization. Kolischer found a "mild desquamative catarrh" frequently, especially about the trigone and ureteral openings. He saw no evidence that the actual passage of a
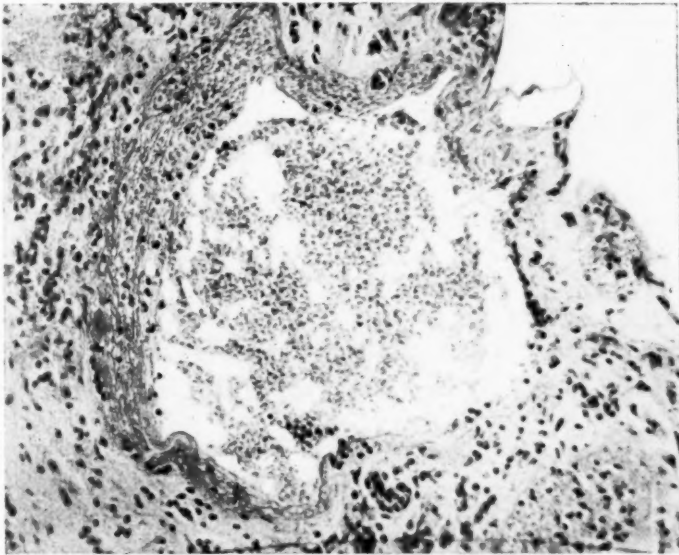
Fig. 7.—A vesicle lying near the surface, partly filled with blood. This has coagulated, producing a lamellated clot attached to the walls, and leaving free blood in the center. The latter has been split up by bubbles of gas. ×150.

catheter had injured the mucosa of the bladder, either at the vesical orifice or on the opposite side, where the tip might impinge. Kolischer further asserted that, with the exception of the Neisseria gonorrheae and the Corynebacterium diphtheriae, the various pathogenic bacteria do not produce cystitis unless the wall of the bladder has been injured previously. This may vary all the way from mild desquamative catarrh to traumatic cystitis or actual necrosis. This statement might or might not apply to organisms capable of producing cystitis emphysematosa.

In the case reported here, there could have been only a minimal amount of injury to the wall of the bladder, as the urine obtained by the second catheterization did not contain blood, and none was observed in the small quantity obtained at necropsy. Such a minute

lesion, then, would surely be overlooked during cystoscopic examination, such as was carried out by Kolischer. If such trauma as that seen in this case is of operative origin, it is not because of the degree of injury to the mucosa, but because bacteria already present are permitted to invade the tissues. Nor would it be reasonable to assert that a catheter alone would produce this minute lesion. Multiple hemorrhages in the submucosa have been observed in cases of chronic distention, and especially in acute distention, after decompression had been performed. These were more noticeable when the decompression had been accomplished rapidly than when the urine had been withdrawn slowly. Hemorrhages in the mucosa of the bladder frequently are seen at necropsy in cases in which there has been no distention of the bladder. Possibly one may believe that any factor capable of producing hemorrhage in the wall of the bladder would be sufficiently potent to encourage bacteria already present to invade the tissues.

In the control of bacteria and their multiplication in the bladder other factors may be operating than those mentioned. Hain, for example, was able to influence the development of bacteria in the urine of a dog by modifications of the diet. Residual urine, left in the bladder after voiding, or after catheterization, has been recognized as important in potential or actual infections of the urinary tract.[2, 11] The inability of the bladder completely to empty itself leaves urine behind capable of perpetuating the growth of bacteria already present, or of providing a culture medium for any that might be introduced during instrumentation. The free use of the catheter associated with lavage of the bladder and complete drainage, is perhaps the reason for the relative immunity from cystitis noted by urologists following examinations and treatments. Cystitis is relatively common in bedridden patients, with disease situated in other parts of the body, and in whom complete drainage of the bladder is not assured. Lavage and drainage may also explain the apparent freedom from the results of slight or even of more extensive injury to the mucosa of the bladder and urethra.

The presence of residual urine indicates some disease in the wall of the bladder, or interference with the nerves that control it, which amounts to the same thing in the end. Cystitis, causing residual urine to remain behind after micturition, may develop in a bedridden patient, and when the disease is acute and the sensorium dulled it may not give rise to symptoms of which the patient would complain. It is possible also for the bladder to be the seat of serious resistance-reducing disease whereas the other organs remain in relatively good condition. In such a state, a degree of injury that is unable normally to allow invasion of bacteria into the wall of the bladder might be enough to initiate the infection. It remains to be demonstrated, however, whether

the ordinary invading organisms of the urinary tract are capable of producing the lesion, or whether some special organisms must be present.

In the case reported, the history of an urethral caruncle and of a chronically irritable bladder at the time of the first visit to the clinic, together with cystoscopic examination and the report of an inflamed mucosa, indicates that for at least fifteen years there may have been local disease of at least moderate severity. Pus in the urine at the time of the last examination indicates either that the cystitis had not disappeared or that it had recurred. The histologic evidences of chronic inflammation confirm the history of long-continued cystitis, but those in the lesion under consideration were, for the most part, of recent origin. During this period it is conceivable that the walls of the bladder had weakened, permitting residual urine to collect. Thus the local condition was apparently favorable for acute exacerbation when a trifling injury to the mucosa was produced.

Examination of an early lesion such as this has been more enlightening than a similar study of those more advanced. It has shown an early stage in the degeneration of the lymphatics of the region, and obstructive phenomena in the blood vessels as well. Giant cells were not observed, although they have been present in all of the cases studied previously. This suggests that they are associated with a later stage of development. Eosinophils were just as abundant as in the other cases, and pigment was found here and there through the tissues; evidently there had been hemorrhage before the present lesion began. Lymphatic vessels, when they were observed, were distended with gas, and in a relatively unchanged condition, unless the hyalin thrombus is of significance. Proliferative lymphangitis, or that associated with infection of the ordinary sorts, was not observed. That gas forming in one place may well be transported to more distant points through the lymphatics is strongly suggested by the figures reproduced. How rapidly this could take place, and how soon a considerable area of the wall of the bladder could be inflated by this means is still uncertain.

SUMMARY

Another case of cystitis emphysematosa is reported, with clinical and pathologic details. This case represents a very early lesion, which probably was initiated by the slight trauma produced by a catheter abrading the mucosa of the bladder. There are two lesions, one older than the other, corresponding to catheterization on two successive days, the latter on the day preceding death. The injuries must have been trivial and did not cause the loss of an appreciable amount of blood, as the control specimens of urine were free from erythrocytes. Perhaps any form of injury to the mucosa, whether by a catheter, instrument or spontaneous hemorrhage, may initiate the lesion if other conditions be fulfilled.

Cystitis appears to be necessary as a background on which cystitis emphysematosa may develop. Evidence is accumulating that the lesion results from some form of infection.

The lymphatics are capable of transporting the gas to a certain extent beyond the point of its production. They are at first distended and then degenerate. There is no evidence that giant cells arise by multiplication of the cells of their endothelial lining.

It is now certain that cystitis emphysematosa develops during life, and is not a postmortem phenomenon. Lowered resistance, at least of the bladder, seems to be necessary for its development, but whether this condition is limited to the last few days of life of a patient practically moribund, or whether it may occur in a patient with only serious disease of the bladder, has not been determined.

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Beckmann, M.: Hyperplasia and Hypertrophy of the Uterine Mucosa. Arch. f. Gynäk. **135:** 519, 1929.

Beckmann describes two forms of hyperplasia of the uterine mucosa. One form which Adler describes as ''hypertrophy'' is dependent upon the ovulation cycle and shows a regular progression through all the stages of hypertrophy. This form is accompanied by profuse and protracted menstrual bleeding. The second type has all the functional stages of hypertrophy present in the uterine mucous membrane at one and the same time and is not always accompanied by menstrual disturbances. This type the author calls ''hyperplasia endometrii glandularis cystica.''

RALPH A. REIS.

Case Reports

REPORT OF A CASE OF FIBROMYOMA OF THE UTERUS WEIGHING 133 POUNDS REMOVED AT OPERATION

By Moses Behrend, A.M., M.D., Philadelphia, Pa.

At THE present time it is most unusual to encounter abdominal tumors of great size. Last year before the Pathological Society of Philadelphia I reported the successful removal of an ovarian cyst weighing 33 pounds. It was thought then that the limit in size had been reached until this patient presented herself for operation. Larger and heavier tumors have been reported than the case under consideration. The reader is referred to Gould and Pyle's book on *Anomalies and Curiosities in Medicine.*

Before operation a diagnosis of ovarian cyst was made. During the operation it was also thought that we were dealing with a huge cyst of the ovary. In certain areas thin walls were noted which contained fluid, while in other areas, solid masses could be felt throughout the tumor mass. After the examination by the pathologist it was decided that this particular neoplasm originally arose from uterine tissue because the tumor was attached to the uterus, and part of the fundus of the uterus had to be sacrificed in its final removal. The pedicle was rather short and fixed.

A. R., age thirty-five years, admitted to the Mt. Sinai Hospital March 2, 1930. The chief complaint was an enormous swelling of the abdomen. About nine years ago patient was seized with sharp abdominal pain in conjunction with her menstrual period. About that time she first noticed a small swelling in her lower abdomen which has become progressively larger. The patient was walking about and working as a druggist up to six weeks ago, when following a nervous breakdown due to business reverses she was advised to rest in bed. She is usually very thirsty, dyspneic, appetite good, and bowels regular. She has no urinary symptoms. Menstruation began at thirteen, was regular, no excessive bleeding. No pain associated with menstruation. She has menstruated about three times in the past three years, last period about ten months ago. Even in the presence of the tumor she considered that she enjoyed good health, except that in the past six weeks she has felt quite weak. She has never been pregnant. Blood pressure 104/58. She was a white, poorly nourished female adult sitting in bed, complaining of thirst, breathing with slight difficulty, with an enormously distended abdomen. On account of the size of the abdomen the edematous legs are sharply abducted and cannot be adducted unless the tumor is raised with the assistance of two persons. The contour of the chest is rendered insignificant as a result of the huge abdomen. The heart action is regular, and the organ is displaced to the left. The abdomen is enlarged to a sphere whose circumference is 5 feet 8 inches. The skin is enormously stretched from the epigastric region to the apex of the swelling. The umbilicus is at a point opposite the epigastric region. The skin of the abdomen is edematous. Upon palpation there are felt areas of fluctuation and other areas of solidity on the lateral aspects of the mass. The mass is painless. Urea nitrogen 13. Blood sugar 0.115. Wassermann weakly positive, Type III. Gruskin test negative. Urine showed no albumin or sugar. Hemoglobin 33, R. B. C. 2,170,000, W. B. C. 6700, polymorphonuclear 88, S.M. 7, L.M. 1, TR. 2, eosinophiles 1. Myelocytes-Polychrom, Anesopoikilocytes present.

Operation.—The patient was operated upon in bed after having been transported to the operating room. This was deemed better than placing her on the operating table because it required eight men to put her from the stretcher to her bed when admitted to the hospital. The incision was begun without anesthetic on account of the anesthesia produced by the pressure of the tumor. A small incision was first made and about two gallons of fluid was released. The incision was then enlarged until the hand could circumnavigate the circumference of the tumor. It was found to be fairly free and movable. The incision was then enlarged to about 14 inches when the tumor was delivered. The thinned-out great omentum covered the tumor for a considerable distance. This was freed. Posteriorly the parietal peritoneum was closely adherent to the tumor; this was incised and sponges used to wipe away the adherent peritoneum. After the tumor was free the pedicle was then clamped, incised, and the growth removed. Immediately after operation the tumor weighed

Fig. 1.—The patient before operation. Note the huge size of the tumor. She is unable to bring the legs together in adduction unless the tumor is raised. Circumference of the abdomen measured 5 feet 8 inches.

133 pounds. The tumor was not aspirated because there were too many solid areas in the tumor. Except for a slight alteration in the pulse the patient passed through the immediate effects of the operation in good condition. The patient received 300 c.c. of blood and reacted well. She passed 50 ounces of urine the first day and 42 ounces of urine the second day. The pulse was good but on the second day signs of pneumonia were elicited, from which she finally died.

Autopsy.—(By Dr. I. Davidsohn, pathologist to the hospital.) The face is very emaciated and pale. The abdomen is pendulous. There is an operative incision in the mid-line along the entire abdomen. The skin of the abdomen and the lower extremities is edematous. The operative incision is extended to the upper end of the abdomen. The diaphragm reaches to the fourth rib on both the left and right sides.

Heart: weighs 310 gm. and measures 9.5 x 10 cm. The pericardial sac contains 85 c.c. of a clear, straw-colored fluid. The left ventricular wall measures 18 to 22

mm. The right ventricular wall measures 8 mm. The cavity of the left ventricle is distinctly enlarged. There is some dilatation of the right ventricle. The auricles and valves present no abnormalities. The mitral ostium measures 9 cm. The aortic ostium measures 6.5 cm. The pulmonary ostium measures 6.5 cm. The tricuspid ostium measures 11 cm. The coronary arteries present no abnormalities. The ascending aorta shows a few areas with distinct longitudinal striations. These changes are suggestive of a syphilitic aortitis.

Left lung weighs 510 gm. There are a few old adhesions. The lung is heavier than normal. The lower lobe shows no abnormalities. The pleura of the upper lobe shows a thin fibrinous exudate. The lobe shows a consolidation involving its posterior two-thirds. On the cut surface the picture is that of complete consolidation. Right lung weighs 280 gm. It shows a few dense adhesions; otherwise there are no abnormalities.

Fig. 2.—Photograph of tumor taken immediately after operation.

Spleen weighs 824 gm. It is very much enlarged. The consistency is very firm. The cut surface shows a very marked follicular hyperplasia.

Liver weighs 2940 gm., and it is considerably enlarged. The surface shows a few yellow spots about the size of rice grains. They are indistinctly demarcated. Similar spots are present on the cut surface which shows an indistinct lobular structure. Gall bladder and pancreas showed no abnormalities.

Left kidney is rather large, weighing 210 gm. The capsule strips with ease. The cortical structure is indistinct, showing an acute clouding swelling. The kidney pelvis is somewhat dilated. Right kidney weighs 220 gm. It shows the same changes as the left, except that the dilation of the pelvis is more marked. Left ureter is slightly dilated but patent. Right ureter is markedly dilated but patent. Adrenals are swollen and edematous.

Peritoneal cavity contains 4096 c.c. of a thin hemorrhagic fluid. Stomach mucous membrane is somewhat thickened and congested; otherwise there are no abnormalities.

Only the lower end of the uterus is present. The fundus has been removed. Right ovary enlarged to about the size of a chicken's egg. It is soft and fluctuating. The cut surface contains a cyst about the size of a walnut, filled with a thick soft material like chocolate. Left parametrium is only partly present and it is closed with many operative sutures. All the pelvic tissues are very edematous. The retroperitoneal space is occupied by large clumps of varicose veins and enlarged glands. The veins on the cut surface are found filled with thrombi.

The tumor measures 60 x 29 x 58 cm. It is formed by the coalescence of four irregularly round bodies, which are more or less accurately demarcated from each other by thick, constricting bands. Scattered throughout the mass are small solid and cystic tumors varying in size from a cherry to an orange. The whole mass is definitely encapsulated by a glistening, smooth membrane through which can be seen a variety of colors from white and pink to red brown and black and contains many dilated blood vessels. The pedicle of the whole tumor is a short stump measuring 7 x 3 x 1½ cm., running off the groove which separated the largest mass from the others. The tumor is of varying consistences, some portions definitely cystic and fluctuating and others definitely solid. Different parts of the mass show degrees of softness in a wide range between these two.

Numerous sections from various parts of the tumor showed a typical structure of fibromyoma. Very pronounced edema is frequent in many places. In others hyaline degeneration is seen. The veins are distended with blood. A marked inflammatory reaction evidenced by round cell infiltration and plasma cells is found in various parts of the tumor. There is no evidence of ovarian tissue. A diagnosis of fibromyoma is made.

Such tumors originate most frequently from the uterus, but they do occasionally arise from the ovary. The left ovary could not be traced, neither during the operation nor in the subsequent examination of the specimen. An attempt to discover it at autopsy was also unsuccessful. The uterus was rather small and the tumor did not appear to be in direct connection with it. It is however quite possible to assume that the fibromyoma originated from the uterus and during its further growth became separated from it and connected through a pedicle. Eventually when it grew to its monstrous size, that connection through the pedicle might have become indistinct as the pedicle was pushed away by the growing tumor.

1738 PINE STREET.

PLACENTA INCRETA

By Boris Kwartin, M.D., and Nathan H. Adler, M.D., F.A.C.S.,
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INTRODUCTION

PLACENTA accreta and increta are among the most serious and, from a prognostic standpoint, among the gravest complications of the afterbirth period. Klaften,[1] in 1928, collected 45 cases, including five which were observed in the Vienna Clinic from 1900 until 1927. Joachimovitz,[2] in 1929, rounded this number out to 70. Since then we were able to find two more cases in the literature. Klostermann[3] reported a case of placenta increta with a uterine rupture. No etiologic factors could be made responsible. Sussig[4] described a placenta accreta with pregnancy in a uterine diverticle. Dr. Goldzieher in the United Israel Zion Hospital, Brooklyn, N. Y., and Dr. Stöhr in the Woman's Hospital, New York City, each showed to one of us a case of placenta accreta.

The rapid increase in the number of reported cases within the last few years would indicate that this condition is not as rare as one is forced to conclude from the various reports in the literature. Polak and Phelan[5] reported one in 6,000; Klaften found one in 14,000; and Nathanson[6] observed approximately 1 case of true placenta accreta in 20,000 deliveries.

We feel that many cases of true placenta accreta are not recognized. The severity of this condition and the importance of its early recognition merit a short discussion, especially since the symptoms and the physical signs in many instances are suggestive and should receive more attention in order to make possible the correct diagnosis.

A case of unusual interest, on account of its symptomatology and antecedent history, came under our observation.

CASE REPORT

Mrs. M. B., gravida ii, para i, twenty-eight years old, was admitted on January 29, 1930, to our obstetric service for cesarean section two weeks before term, on account of a previous cesarean section and symptoms of threatening rupture. In December, 1926, the patient—a primipara—was admitted to our obstetric service at term. She was in labor for 40 hours with membranes ruptured for 12 hours, a persistent unrotated right occiput posterior presentation and floating head. The pelvic measurements showed a moderately generally contracted pelvis. A low two-flap cesarean section was performed and a normal child and placenta delivered. The postoperative course was rather stormy. The patient ran a temperature between

99° and 102° with signs of bronchopneumonia, severe cough and moist râles all over chest. She also had a severe wound infection involving all layers of the abdominal wall. The patient finally recovered and was discharged after a stay of 6 weeks in the hospital. She was well throughout the intervening period and also throughout the second pregnancy up to admission to the hospital. On examination, the uterus was found to be irregularly enlarged, of an hour-glass appearance. The patient complained of indefinite lower abdominal cramps for the last week and had slight dark bloody vaginal discharge for the last 24 hours. On account of these symptoms it was decided not to wait till term and proceed at once with the opera-tion. The patient's condition before operation was satisfactory. Blood pressure, temperature, pulse and respiration were normal. Urinary and blood findings were negative. Under spinal anesthesia, a low classical cesarean section was performed. An hour-glass uterus with the omentum adherent to the entire anterior surface of the uterus and to the abdominal wall was found. The scar of the previous opera-tion was noted in the lower uterine segment. This portion of the uterus was intact,

Fig. 1.—Placenta increta. Ingrowth of chorionic villi into the musculature. Ab-sence of decidual elements. (X160.)

yet markedly thinned out and bulging. The bladder was adherent to the old scar. A female infant was extracted with an asymmetry of the lower portion of the right face, apparently due to the distortion of the uterine cavity. Manual removal of the placenta was attempted but no plane of cleavage could be found. The uterine muscle was flaccid and soft and there was no bleeding. The diagnosis of placenta accreta was made, a supravaginal hysterectomy was decided upon and performed. The postoperative course was smooth. The patient made an uneventful recovery and was discharged in excellent condition two weeks after the operation. The asymmetry of the infant's face corrected itself within a few weeks.

PATHOLOGIC REPORT

Gross.—A supracervically amputated, very markedly enlarged uterus, measuring 210 x 220 mm. was received. The uterus has been sectioned along its anterior surface. The thickness of its wall varies from 38 mm. in its widest to 12 mm. in its narrowest diameter. In the right lower portion of the uterus, extending over an area of 110 x 108 mm. there is a piece of placental tissue which is firmly adherent

to the underlying structures and cannot be removed from the uterine wall without tearing portions of uterine musculature with it. On cross section, one cannot find a line of cleavage between the placenta and the underlying uterine structures, but one can already observe, with the naked eye, the irregular ingrowth of chorionic substance into the muscularis. Especially well marked is this ingrowth in the region of the old scar and in these places the muscularis is thinned out to 1 to 2 mm., with placental tissue reaching down to the serosa.

Microscopic.—Sections were taken from portions of the uterus, with and without placenta, and from the thinned out bulging portions of the scar region, where, grossly, no musculature could be noticed. They were stained with hematoxylin and eosin, van Gieson's stain, Mallory's aniline blue phosphomolybdic acid stain and Weigert's stain for elastic fibers.

The picture as observed under the microscope is a rather striking one. The chorionic villi extend deep into the muscularis without any intervening decidua
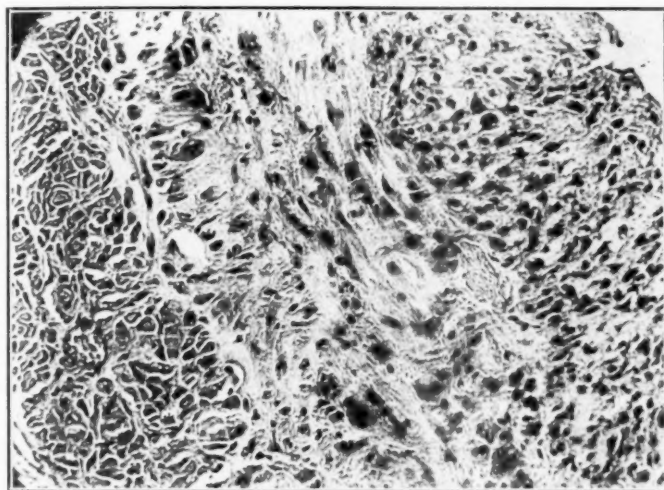
Fig. 2.—Marked hypoplasia of decidua vera. (×160.)

spongiosa or even compacta. For the most part, they are in intimate association with muscle fibers, pushing apart and destroying the muscle cells and penetrating towards the serosa. Only occasionally can a few distorted remnants of decidual cells be noted. The fibrinoid (hyaline) layer of Nitabuch, which is best demonstrated by Mallory's connective tissue stain, varies in thickness from 20 to 4 micra and in numerous places is broken through by the ingrowing chorionic villi. In the fibrinoid layer minute deposits of calcium can be seen. Very often the upper layers of the muscle cells undergo degenerative changes. They swell, show granular and hyaline-droplet degeneration, their nuclei lose much of their staining capacity and suffer kariolytic changes. They take on the appearance of decidua like cells. The lymph spaces and the veins between the muscle bundles are invaded by chorionic villi.

Sections from the region of the scar show only occasional muscle fibers. For the most part, the uterine wall consists of collagen fibrils with numerous fibroblasts covered by serosa. The placenta, i.e., the chorionic villi without decidua, rests directly on this fibrous layer and reaches the serous coat in places by separating the connective tissue bundles.

Sections from the fundus uteri reveal only a minutest decidual reaction of the endometrium. The decidual cells are small, with pyknotic nuclei and the cytoplasm is coarsely granular. This layer is only 30 to 60 micra thick. Glandular elements are absent.

Diagnosis.—Placenta increta.

DISCUSSION

The normal separation of the placenta is facilitated by the spongy decidual layer. After the expulsion of the fetus, the venous spaces fill with blood and as the contractions and relaxations of the musculature continue, separation occurs. If this layer is absent, one can easily perceive that separation will be more difficult. The partial or complete absence of decidua compacta will cause a still greater difficulty in the separation. If the chorionic villi are in direct contact with and penetrate into the muscle layer, separation will be impossible without tearing portions of the myometrium. In the presence of only a thin layer of decidua compacta or in the absence of same, we speak of placenta accreta vera. If the chorionic villi penetrate into the muscle layers, the condition known as placenta increta results. From these basic anatomic considerations one can easily perceive that the clinical course will be influenced by the extent of chorionic invasion.

Three factors are usually made responsible for this anomaly:

1. The condition of the uterine mucosa at the time of nidation of the ovum: maldevelopment of the uterus, infantile uterus with atrophy or hypoplasia of the endometrium are among the primary factors. Secondary destructive changes, due to repeated curettages, septic endometritis, vaporization, previous manual removal of retained placentas, diverticular pregnancies, atrophic, thinned-out endometrium above uterine myomata are etiologic factors of great importance. To this we would like to add previous cesarean sections with placenta formation at the site of the scar. The question, whether the scar disappears completely after repeated cesareans and is replaced by muscle tissue or whether the fibrous tissue persists, is still a matter of debate. Many obstetricians definitely deny the persistence of the scar; however, we have repeatedly seen, at the time of cesarean sections, as well as in hysterectomized and postmortem material after cesareans, the persistence of such scars.

2. Excessive growth of the chorionic elements. Some authors believe that a primary tendency toward excessive growth on the part of chorionic villi can be made responsible for this anatomic defect.

3. Insufficient antiferment production against the arrosive power of the trophoblast, possibly due to deficiency in the hormonic cycle of the maternal organism. These assumptions are more or less of a theoretical nature and need further substantiation.

All of these three factors combined may possibly produce this an-
atomic defect; yet, from the study of the literature and from the evi-
dence in our case, we would consider that endometrial defects are of
greatest importance.   The marked hypoplasia of the entire endometrium
and the poor development of decidua, which for the most part was
absent, the persistence of the scar from the previous cesarean section
were the etiologic factors in our case.   The fact that the chorionic villi
penetrated to the serosa especially in the region of the scar brings up
the problem of the advisability of low cesarean section, which we are
not able to answer with the insufficient material at hand.

Placenta accreta has been noted at any stage during the course of
pregnancy, from the third month till term.   Unfortunately, the symp-
toms and signs occur rather late, mostly after the child has been de-
livered, and it is very easily mistaken for a retained placenta.   There-
fore, signs and symptoms which are helpful in the recognition of this
condition before birth cannot be emphasized too much.   The pronounced
thinness of the uterine musculature, the insufficient amount of endome-
trial tissue to cope with the erosive activity of the chorionic villi,
accentuate the similarity of tubal pregnancy and placenta accreta.
Changes simulating decidual reaction in the upper layers of the mus-
cularis in direct contact with the chorionic villi where decidua is ab-
sent are also common in both conditions.   The clinical course is alike;
the symptoms observed in our case—dark brown vaginal spotting, which
is reminiscent of discharge found in tubal gestation, and the cramp-
like pains in the lower abdomen—are of paramount value and led
one of us to assume that an abnormality existed, whereupon it was de-
cided not to delay the operation until term.

The therapy depends upon prompt recognition of the abnormality
and all authors agree that early hysterectomy is the only procedure to
be resorted to.   The prognosis is good if the patient does not lose too
much blood, and no sepsis from protracted attempted manual removal
sets in.

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AN UNUSUAL ACARDIACUS

By T. M. Boulware, M.D., Birmingham, Ala.

(From the Norwood Hospital and Clinic)

MRS. C., white, aged thirty-one, gravida seven, first visited Norwood Clinic 2/20/30, being referred by her family physician because of high blood pressure. During her last two pregnancies the patient had noticed frequent headaches and dizzy spells and during her last labor she had several convulsions. Last menstrual period was 9/15/29 with preceding period the month before. Severe and persistent headache, dizzy sensations, black specks be.ore the eyes, and dyspnea had been prominent symptoms for two months prior to clinic visit. No fetal movements were reported.
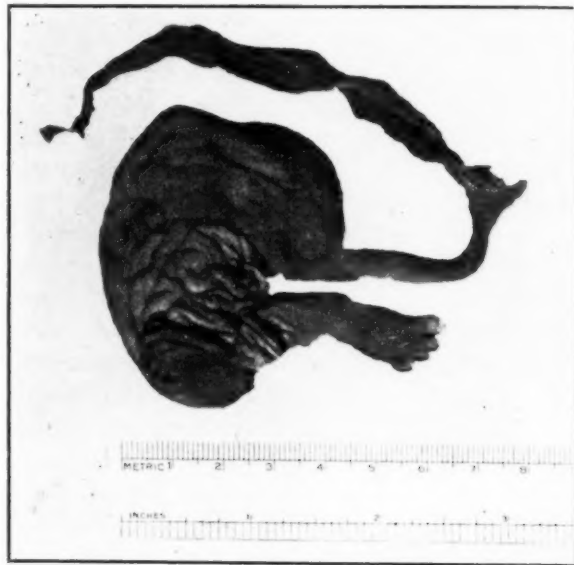
Fig. 1.

Examination showed a patient of white pasty complexion and with a moderate amount of edema of both lower extremities. There was also some slight puffiness about the eyes. The eyegrounds showed a typical albuminuric retinitis. The heart was negative, the B.P. 200/120. Blood findings were those of a moderately severe secondary anemia. The urine showed a high specific gravity, seven grams of albumen per liter, and many fine granular and hyaline casts. The N.P.N. was 33. The patient was admitted to Norwood Hospital same date and hysterotomy with sterilization advised.

On 2/21/30 the uterus was opened through midline incision. The placenta was encountered on the anterior uterine wall and one normal male fetus of 24 cm. delivered. Another smaller mass was then felt lower in the uterus, seemingly enclosed in a second membranous envelope. This second mass had its own small umbilical cord which appeared to be inserted near one end of the common placenta. After completion of the hysterotomy, sterilization by tubal section and ligation was done.

Laboratory examination of the specimens showed the following:

The normal fetus was well developed and its tissues in a good state of preservation. The second mass consisted of a fetal monster made up largely of connective tissue covered by skin. From one pole of the irregular fetal mass projected a foot. This foot was of the same stage of development as those of the normal fetus. The outer two toes were webbed. The bones of the thigh and leg were apparently present and the entire structure was attached to a deep central bony mass of irregular outline. A nipple-like body, similar in size and shape to the penis of the normal fetus, was also present. The umbilical cord of the monster measured 0.7 cm. at its point of fetal attachment. The large placenta was studded with small infarcts.

This interesting specimen offers much ground for speculation. From the findings the case appeared to have been one of single ovum twins with one chorion, two amnions, and two distinct umbilical cord insertions in the common placenta. As most of the tissues of the monster were of ectodermal and mesodermal origin, it is at least interesting to wonder if some accident during segmentation of the fertilized ovum could explain the abnormality. Fertilization of a polar body split off during maturation would seem unlikely because of the single chorion. Even if such fertilization were possible, as has been reported in certain insects, and the two ova imbedded in close proximity with subsequent partial fusion of chorions, we would expect to find not a single placental system but two, even though joined. Intrauterine amputation or mutilation from oligohydramnios does not appear likely from the findings. The most plausible explanation would seem to be that due to its larger placental area and better nutritional opportunities, the heart of the normal fetus was sufficiently strong to overcome that of the anomalous one, with subsequent degeneration of the weaker pump at an early stage of fetal development. The nutrition thus afforded the weaker twin was probably insufficient for its total needs and for some unknown reason the lower extremity and associated structures developed at the expense of the other tissues.

The maternal nephritic state may have been of some etiologic importance but probably was only coincidental.

2501 NORTH SIXTEENTH AVE.

CASE REPORTS

1. DOUBLE UTERUS, DOUBLE CERVIX, AND DOUBLE VAGINA
2. ABSENCE OF THE VAGINA

BY REXFORD W. MCBRIDE, M.D., WOODLAND, CALIF.

(From the Department of Surgery, Woodland Clinic)

CASE 1.—A woman aged twenty-five years entered the clinic complaining of attacks of frequency and dysuria of three years' duration. The attacks were of sudden onset and quickly increased in severity until she was forced to void small
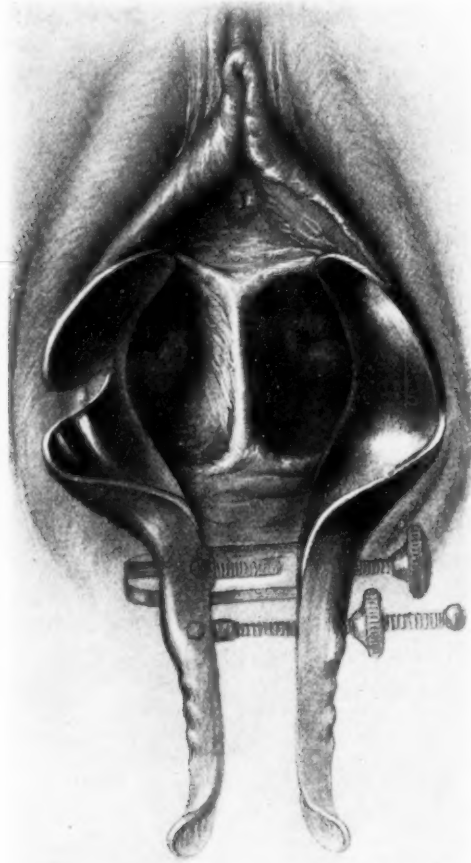

Fig. 1.—Double vagina and double uterus. Vaginal septum complete.

amounts every ten to fifteen minutes with marked dysuria. She also complained of a continuous aching pain in the left lower quadrant which was increased by any unusual exertion. Treatment had relieved her frequency and dysuria temporarily but had never affected her left lower quadrant pain. Incidentally she complained of sterility.

Routine physical examination disclosed nothing of import. Pelvic examination revealed two vaginas, the septum being complete and extending down to the hymenal ring. Both vaginas contained considerable thick yellow discharge, especially the right. For this reason, uterosalpingography was not attempted. There were two complete and normal cervices, one for each vagina. There were also two distinct fundi which were anteverted, somewhat fixed, tender and apparently of normal size. Finally, there was a fairly large, tender, moderately firm, fixed mass on the left side of the pelvis (Fig. 1).
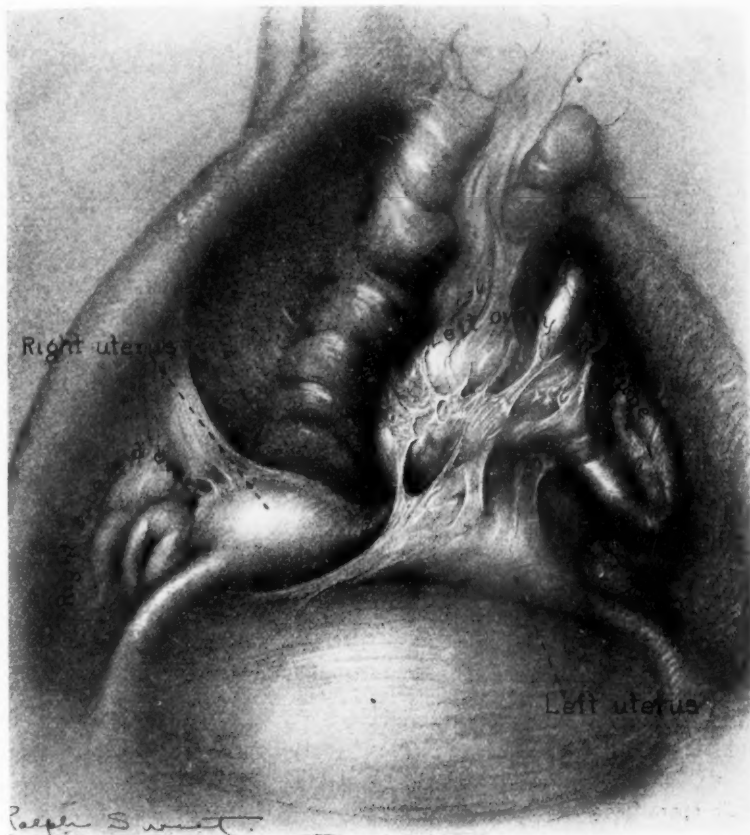
Fig. 2.—Double uterus and vagina. Two tubes and ovaries. Tuboovarian abscess, left, with pyosalpinx.

At operation two distinct uteri were found, with no fusion between them except at the meeting point of the two cervices. On the left there was a cystic tumor 8 cm. in diameter which was firmly bound to the left uterus, posterior peritoneum and left ureter, by dense adhesions. This proved to be a pyosalpinx and tuboovarian abscess. The right ovary was normal. The right tube was markedly thickened, tortuous and bound to the posterior surface of the right uterus by firm adhesions. The right tube and left pelvic mass were dissected free and a double hysterectomy done (Fig. 2).

The postoperative course was uneventful. The patient has been entirely relieved of pelvic pain as well as of her urinary symptoms.

CASE 2.—A girl of eighteen years of age complaining of amenorrhea. There had never been any menstrual flow or any reaction suggesting a menstrual period.

General physical examination was entirely negative. There was nothing to suggest any glandular dysfunction. Her mentality was normal, perhaps a little above the average. She had no idea of her physical deficiency, nor had she the slightest knowledge of any sex reaction.

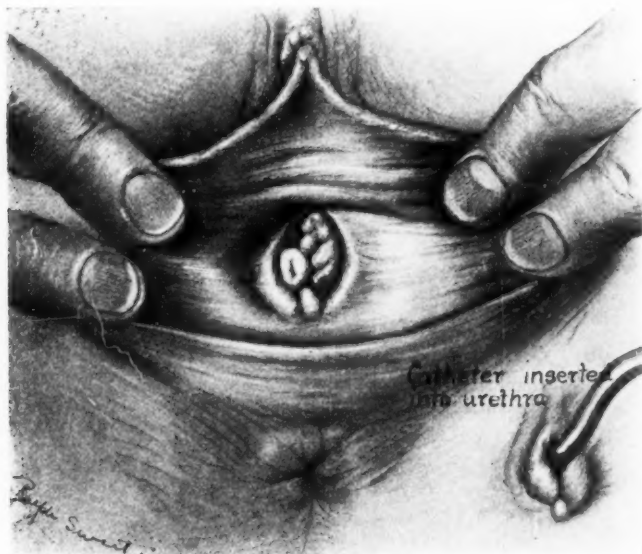Laboratory tests, including basal metabolic rate, were normal.

Fig. 3.—Congenital absence of vagina. No rudimentary organ demonstrable. No uterus demonstrable on rectal-bimanual.

Pelvic examination revealed a complete absence of the vagina. There was not even a dimple suggesting its usual location. The labia majora and minora were present but deficient at their lower extremities where they were fused into a broad, strong perineal body. On rectal bimanual examination no mass or nodule or any other suggestion of a uterus could be discovered, but there was a resistant band extending across the pelvis at about the level of the upper portions of the two broad ligaments. The ovaries could not be palpated (Fig. 3).

Plastic operation was offered and refused.

WOODLAND CLINIC.

Society Transactions

THE AMERICAN GYNECOLOGICAL SOCIETY

FIFTY-FIFTH ANNUAL MEETING

Hot Springs, Virginia

MAY 19 TO 22, 1930

1. **Ovarian and Pituitary Changes Associated with Hydatidiform Mole and Chorioepithelioma,** by Dr. Emil Novak, Baltimore, Md., and Dr. A. K. Koff, Baltimore, Md. (For original article, see page 481, October issue.)

DISCUSSION

DR. JOSEPH L. BAER, Chicago, Ill.—Most of the earlier references to the problem of lutein cysts, chorioepithelioma malignum and hydatidiform mole are noted by the essayist. It is of interest that Penkert in 1910 stated that neither a mole, a chorioepithelioma, or ovarian changes are primary but that the changes in the ovary and the formation of a mole might be caused by one hypothetical hormone. The essayist mentioned that in only one other case found in the literature had there been an opportunity of examining the pituitary gland. It is in a case of chorio-epithelioma. Dr. Novak will, I am sure, welcome the data on three additional cases. Berblinger examined the hypophyses in two cases of chorioepithelioma. In one of his cases of chorioepithelioma the uterus was removed in the fourth month of pregnancy. The patient died three months later. Metastases were found in the lungs and brain. The hypophysis still showed ''Schwangerschaftszellen,'' many eosinophile cells but no diminution of the basophilic cells. The author does not believe that there were more changes in the hypophysis than would be expected in such short time after pregnancy. Another case of Berblinger showed many chorioepithelioma metastases in both lungs. The hypophysis weighed 0.77 grams. The pregnancy was interrupted two months prior to death. The hypophysis contained many ''Schwanger-schaftszellen'' in a state of involution but none fully developed. According to the quantity of tumor tissue which was present in the body, specific changes in the hypophysis should have been much more marked if there was an actual interrelation between chorioepithelioma and the hypophysis.

Gentili reports the case of a woman, widowed seven years, with a chorioepithelioma of the uterus and diffuse metastases. There was no corpus luteum present in the ovaries. The anterior lobe of the hypophysis contained colloids and lipoids and many pregnancy cells with a few basophilic and acidophilic cells and a passive hyperemia.

Concerning Dr. Novak's fourth case report, there are instances in the literature which show an apparent disappearance of the primary chorioepithelioma. Of course, it is questionable whether the disappeared tumor actually was a malignant chorio-epithelioma. This subject is always open for discussion since none of these cases are posted because of recovery. But assuming that the primary tumor disappeared, why did the metastases not disappear also? R. Meyer in Stoeckel's *Handbuch der Gynaekologie* (1930) expresses the relation of disappearance of primary chorio-epithelioma to the metastases in the following words: ''Was den Primaertumoren

recht ist, muss den Metastasen billig sein,'' the English equivalent of which may be interpreted as, ''what is sauce for the goose is sauce for the gander.''

Changes in the anterior portion of the hypophysis as seen for example in small adenoma or infarction of the hypophysis, produce a marked cachexia. If chorioepithelioma produces marked changes in the anterior lobe of the hypophysis we would expect in all these cases at least some evidence of cachexia. Did Dr. Novak's case show such evidence?

Berblinger mentions the case of a thirty-six-year-old male who died of a chorioepithelioma of the right testis with metastasis in the brain. The hypophysis was examined very carefully and did not show any changes similar to the ones found in the hypophysis in pregnancy. Probably, however, the group which this case typifies has no bearing, for these tumors are really teratomas and the patients lack two out of the triad of structures under consideration here.

DR. OTTO H. SCHWARZ, ST. LOUIS, MO.—The marked predominence of chief cells in the anterior pituitary lobe in a case of hydatidiform mole observed by Dr. Novak is of great significance on account of the numerous studies concerning the relationship between the anterior pituitary lobe and the ovary. The opportunity for such observations as Dr. Novak has made does not present itself often, and he is to be congratulated for his alertness in making this comparative study.

It is of interest to mention that the picture which is described in the ovary in cases of hydatidiform mole, is more exaggerated but somewhat similar to the follicular atresia taking place before puberty and during normal pregnancy.

I believe that the chief cells are a more predominant cell in the anterior pituitary lobe before puberty than are the eosinophiles. The observation of Dr. Novak points out that these same cells, so-called chief cells, are markedly increased in hydatidiform moles just as they are in normal pregnancy.

It has always seemed to me that the luteinization which occurs in the mouse in the Zondek-Aschheim test, appears more as a theca luteinization than a granulosa luteinization. I should like to ask Dr. Novak about this particular point.

I believe there are now four hormones described for the anterior pituitary lobe: the growth hormone, supposedly connected with the eosinophiles; the hormone causing increased specific dynamic action of food stuffs (Kestner) and the two hormones associated with follicular changes and luteinization in the ovaries. I believe all this work will result in a more thorough study of the histology of the pituitary body in various stages of the life cycle in order to determine possibly what particular cell types may be responsible for any particular hormone.

DR. COLLIN FOULKROD, PHILADELPHIA, PA.—It seems to me that this presentation should not be allowed to pass without a word of commendation. It represents a new line of thought. When at Jefferson Hospital, Dr. Bland removed a chorioepithelioma of the uterus showing double ovarian cystoma, I had occasion to look up the literature on the relationship of these cysts to such a condition. I was amazed to find that in the most comprehensive pathology and in more recent work there was very little, if any, reference made to the changes in the pituitary and ovaries associated with hydatidiform mole or chorioepithelioma. I believe it represents a very interesting line of thought and may prove that there must be something or other that prevents many pregnancies from developing into chorioepithelioma.

DR. NOVAK (closing).—I am indebted to Dr. Baer for bringing together a few more cases in which some study of the histology of the hypophysis has been made in instances of hydatidiform mole or chorioepithelioma. I was also much interested in his reference to the question of the occasional disappearance of the primary tumor in cases of chorioepithelioma. Our case 4 was an instance of this type, although I

did not have time to present it in the brief summary of our paper which I made. This unusual case we are describing in full in another paper, which will soon appear in the AMERICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY. In this case there was no question that there had been a primary chorioepithelioma in the uterus, as we had the opportunity of studying the original curettings, which had been obtained long before general dissemination occurred. I do not believe that cachexia is of very great importance from the standpoint of diagnosis, any more than it is in the diagnosis of malignancy generally. In advanced cases one would, of course, expect to find it.

Dr. Schwarz brought up the interesting question of the morphology of the lutein cells in cases of the group which we have described. I agree with him that in many instances, as in some of those which I showed on the screen, the lutein cells resemble the typical granulosa lutein cells of the corpus luteum far less than they do the paralutein cells, which are, of course, of thecal origin. On the other hand, as we have also shown, the lining of some of the cysts is of the genuinely granulosa cell lutein type.

With regard to the pathologic physiology of the subject, I believe we should still be quite conservative. New hormones are being described almost from day to day, and broad conclusions are being reached on very insufficient evidence. For example, Zondek describes in the hypophysis a hormone which he calls Prolan A, concerned with follicle growth and related to folliculin, and another hormone which he calls Prolan B, associated with the corpus luteum development and related to the hormone of the latter (Progestin). The evidence for this conclusion, however, is not by any means complete. On the other hand, there can be no doubt that these recent studies will throw a great light upon the question of the origin and significance of such lesions as we have described.

2. **The Present Status of the Treatment of Carcinoma of the Cervix Uteri,** by Prof. Erwin Zweifel, Munich, Germany. (By invitation.) (For original article see page 595.)

DISCUSSION

DR. GEORGE GRAY WARD, NEW YORK CITY.—Prof. Zweifel presents the German viewpoint of this very important subject of cancer of the cervix. As he pointed out, it is an undecided question whether operation, irradiation, or some combination of the two is best. The figures for radical operation and irradiation are nearly the same. Of course, when we speak of operation we are speaking of a case that is presumably operable. When speaking of irradiation we include that very large group of cases where operation is out of the question. At the Woman's Hospital, in the light of our experience of over eleven years with the use of radium, we cannot accept the idea that operation alone is better than irradiation in cancer of the cervix.

The question of operative technic was brought out by Prof. Zweifel as being very important in determining results. We all know how very variable it is. The same thing can be said of the technic of irradiation. I am sure all of us who have seen many of these cases come across instances of gross abuse of radium. It requires skill in the use of it just as in operations. There are a comparatively limited number of men who are competent to do a proper radical operation for cancer of the uterus, taking the profession by and large. Now the operative technic has presumably in the best hands reached its zenith, but that is not true of irradiation. We are learning more and more each day regarding the technic of irradiation.

The great difficulty in studying the statistics is in knowing the extent of the disease in the cases reported. Heyman stated recently in this country, that he had three presumable experts, all members of the American Gynecological Society, examine a case to decide what degree of the disease existed and they all disagreed. I was one of them. It is true one man calls a case operable and another inoperable and that is what makes it so difficult to make a comparative study of the various statistics. For instance, in the Woman's Hospital operability definitely means, so far as we can tell, the disease limited to the cervix, or in other words "borderline" or less. If we can demonstrate in any way that it is beyond the cervix we call it inoperable. Of course, we well know that Victor Bonney in London would operate on many of those cases that we called inoperable because he operates where there is a very definite invasion of the parametrium and vagina. His figures are very interesting given in his recent Hunterian Lecture of last February. He has seen 450 cases, operating 284 of them with the radical Wertheim technic with five-year follow-up. He had a 16.5 per cent total primary mortality, 8 per cent in his last 98 cases, so this shows that he is improving his technic. His relative cures were 38.7 per cent; that means operable cases from his standpoint. His absolute cure rate is 24.4 per cent. He found 43 per cent of the glands involved.

I have just completed a study of eleven years of work at the Woman's Hospital and I have made a report to be published later. It is an analysis made by professional statisticians of our total work and I will simply give you an abstract of the figures compiled. In eleven years and three months we had 259 cases, of which we had to reject 8 cases that were absolutely hopeless. We have treated 251 cases. Of these 25.9 per cent were in what we call the operable class, that is confined to the cervix; 74.1 per cent were beyond that stage. We had a primary mortality treated with radium of 1.1 per cent.

Our five-year end-results are 63 living, giving us an absolute cure of 24.3 per cent and a relative cure of 25.1 per cent.

Of these cases we treated 170 by our own method which Dr. Farrar and myself have developed, using radium alone. We give the original treatment, reradiate whenever necessary and personally follow up the cases through the five years. Our relative cure rate in that group was 25.3 per cent.

A point of considerable interest is that in the follow-up of these cases there were 8.6 per cent of the early group (Class I and II) which we have been unable to trace, while there were only 1.5 per cent of the advanced group which were not traced. It is probable that some of these early cases not traced are well and living but that is, of course, only an inference. Of the early cases treated by our own method we have 57.1 per cent alive and well after five years. We published our last report two years ago and now we have two more five-year series amounting to 88 cases, giving us a relative cure of our last two years of 26.1 per cent. As to age we have had 15 cases in the twenties, the youngest being 24 years of age.

We have been using high voltage x-ray only for the past year because we did not have the apparatus previous to that time. We have treated 35 advanced cases only, with radium and high voltage x-ray during this period.

A point of interest is that Pitts and Waterman of Providence, R. I., working with radium and following a similar technic to ours, have shown me their figures. They have seen 90 cases, 88 of which they have followed and they have obtained an absolute cure of 17.4 per cent, showing that others can carry out this line of treatment, without high voltage x-ray with benefit.

In conclusion, I believe the smaller dosage of radium and the frequent follow-up, with reradiation whenever indicated (and that sometimes means several years after the initial disease), will be found to be more valuable than the heavier dosage, and I look with high hope to the high voltage x-ray to improve our statistics. We

hope that it will take care of the 40 per cent of gland involvement. Without the high voltage for the glands our absolute cure of 24.3 per cent is nearly equal to Bonney's 24.4 per cent. More time is necessary to prove Prof. Zweifel's contention that the combined method will give the best results. Until the combined method shows better results in spite of primary mortality, we prefer to employ irradiation alone in cancer of the cervix.

DR. JOSEPH BRETTAUER, NEW YORK, N. Y.—There are three points I would like to make. First, that cancer statistics are not a reliable means for getting an insight into cancer results. We know that each cancer differs in its pathology and therefore in its prognostic features; as long as we have not a uniform method of grouping these cases, statistics do not give us the actual conditions. Furthermore, reliable follow-up work is lacking, such as is carried for instance in Sweden (under Government control).

Second, in connection with the suggested preoperative radiation, I believe that complications like vesical and urethral fistulás will result more frequently, because technical difficulties caused by radiation will have to be overcome.

Third, I am convinced that the occurrence of cancer of the cervix in women of the Jewish race is infinitely smaller than in other races, the report compiled by the Cancer Committee of the League of Nations to the contrary notwithstanding. This conviction is based upon an experience of forty years in hospital and private practice, with a clientele predominantly Jewish, and coincided with that of the Chief of a Woman's Hospital in Kiev, Russia, with whom I was in communication in 1908, and whose figures were essentially the same as mine.

PROF. FELIX von MIKULICZ, BERLIN, GERMANY.—I have come to the United States in order to study the different methods of treatment of carcinoma of the female genital organs, which as we know also in Germany, are very successful. I have already learned a great deal and I will try to utilize my experiences after returning to Europe.

I was most impressed by the histologic differentiation of the types of carcinoma and their classification in radio-sensitive and radio-resistant groups. I believe that we thereby will be able to improve greatly our therapeutic results.

In studying the statistics of the world dealing with carcinoma of the cervix, we are impressed by the fact that on the average the results are similar not only by radio therapy but also by operative treatment.

These results, which mean that we can save only every fourth affected woman, are not satisfactory and compel us to try to improve our therapeutic methods. The similarity of results, however, prove that we shall be able to progress rather by the utilization of our knowledge of the biology of the carcinoma than by the improvement of the different methods of treatment. The aid, therefore, may be looked for in the histologic feature of the carcinoma. If there are two groups of cervix carcinoma, namely, the radio-sensitive and the radio-resistant, and if the pathologist is able to differentiate them, then we should only irradiate the first group and operate upon the second group.

The Stoeckel Klinik of Berlin has been treating for the last one and a half years all cases of carcinoma of the cervix with radium and combined operation. Every case of carcinoma of the cervix receives first two 5 to 6000 milligram hours of radium distributed over cervix and vagina. Three months after beginning of the treatment in all cases where operation is possible (a large number of the primary inoperable cases become operable by the irradiation) the radical hysterectomy of Schauta-Stoeckel is performed. The operative mortality is 7 to 8 per cent. A deep x-ray irradiation follows after a complete convalescence, a procedure which is also applied in those cases which did not become operable after irradiation.

Naturally, we are not able yet to report about permanent cures. The leading thought, however, of our method is, I believe, good. We try to combine the advantages of radium and x-ray therapy with the advantages of the operative treatment and we succeeded in reducing the primary operative mortality to a great extent.

Histologic examinations prove the value of our methods. The uteri of cases which were primarily inoperable, and which became operable by the irradiation, were histologically examined and intact carcinoma cells were found in the parametria. That shows clearly that the radical operation can greatly improve results where radiotherapy has been previously used.

But after the experiences developed in the United States it will probably be better to not operate on all cases of carcinoma as we used to do heretofore, but to use operative procedures in the radioresistant cases only. We may assume that thus we shall be able still further to reduce the primary mortality, and by the combination of radiotherapy and operation we can improve our results.

DR. WILLIAM P. HEALY, NEW YORK CITY.—Those of us who meet Dr. Heyman when he was here about five or six years ago with Prof. Forssell may remember that they both opposed the use of external irradiation in carcinoma of the cervix. The late Harold Bailey always emphasized the necessity of external irradiation in the treatment of carcinoma of the cervix and in the early years he applied radium about the pelvic girdle as well as at the site of the lesion. When I succeeded him at the Memorial Hospital we continued the plan of cross fire with radium applied in the cervical canal against the cervix and we substituted x-ray, low voltage machine, for radium externally.

We have treated about 2000 cases and our total salvage of all cases is about 25 per cent. We have an exact follow-up on all of those cases and we count them as dead if we do not know where they are.

In 1922, 1923, and 1924 when we were using low voltage x-ray for external irradiation, we have in those years 44.5 per cent of five-year freedom from recurrence of active disease in all of the favorable cases and 65 per cent in early cases.

We feel that surgery has very little value in carcinoma of the cervix except in certain instances where the primary disease of the cervix fails to respond to radiation therapy satisfactorily and the patient still has a uterus that is removable surgically. If one attempts further irradiation in that type of cervix you will bring about a persistent necrotic and painful ulcer, whereas hysterectomy will at least heal over the vaginal vault even if it will not permanently cure the disease and will therefore render the patient more comfortable. We believe that external irradiation with high voltage x-ray will improve the 44.5 per cent results which we were able to shew with low voltage x-ray.

We know that the majority of the cases, 60 per cent of them, that come to us for treatment are in an advanced stage and cannot be cured. In many of them we are doubtful if we can use radium and we give them first a high voltage pelvic x-ray cycle consisting of five exposures which surround the pelvic girdle and the space which is centered over the third lumbar spine so as to affect the prevertebral lymph glands. The patient is instructed to take several douches daily. Frequently at the end of ten or twelve days the lesion will have responded so completely and so well that the infection will have subsided, the necrotic tissue will have disappeared, and it will be possible to go ahead with radium in a complete way rather than in a partial way. I would like to recommend that high voltage x-ray be used as a routine procedure first in all of the less favorable cases.

DR. WILLIAM S. STONE, NEW YORK CITY.—There is one point that has been considered only slightly today, which is most important. I believe that perhaps the greatest contribution that has been made in the last two years to the study of

cancer is its histologic gradation, which was introduced in this country by Broders of The Mayo Clinic. It is not necessary to follow his classification, but I do think that at the present time a diagnosis of cancer of the cervix without qualifications regarding its type means nothing. There are so many different kinds of cancer of the breast and of the cervix. Most of us are not sufficiently competent to judge of the histologic nature of these tumors without the aid of a pathologist. If Dr. Bonney, who has just been quoted by Dr. Ward, had more carefully analyzed his cases in conjunction with some pathologist and had selected cases for his operations with regard to their malignant qualities, his cures would have been a great deal higher. If you stop to consider it, surgery has never had a fair show, and this study of the different malignant qualities from their histologic characteristics will aid materially in the choice of the method of treatment. Cancer of the cervix offers a wonderful opportunity to show the value of this study.

DR. JOHN A. McGLINN, PHILADELPHIA, PA.—It seems to me if progress is to be made in the treatment of carcinoma or any other serious malady an important thing is the early diagnosis of the disease and of those conditions which may lead to the disease. The time has now arrived when the profession must realize that it must assume an entirely different attitude toward the body politic. Things have changed considerably. It is no longer possible for us not to take an active part in public health education. The body politic is realizing, very forcibly, the economic value of good health and is taking away from the medical profession leadership in public health matters. In many cases their leadership is not particularly good and they are wasting a lot of money and not getting the best results. In this problem, as in all public health problems, there are two things to be considered: the proper education of the doctor after he graduates and proper education of the public. It does not do to have large meetings on cancer, with some star orator to lecture to the men who are going to send us cases, because after all he addresses only a certain number of people and what he has to say is usually over the heads of his audience. I believe it is much better to do what we have inaugurated in the Philadelphia County Medical Society, a series of cancer days where the subject of cancer is brought down to the level of the man who is going out to see a case and refer it to some one else. These small group meetings are much better than large public meetings. Illustrations are shown of what cancer is, specimens are shown, and a plain talk given on the necessity of the early recognition of the disease, talks on precancerous lesions, etc. This will accomplish a great deal more than the methods we have been following.

We must assume leadership and we must realize that our methods of disseminating knowledge to the public as we have used in the past are entirely erroneous. The Philadelphia County Medical Society has recently established a bureau of public information and we have the cooperation of broadcasting stations and the press in the dissemination of proper knowledge to the public. We are avoiding the establishment of unnecessary clinics or clinics in places where they are already existing.

DR. FREDERICK J. TAUSSIG, ST. LOUIS, Mo.—Regarding the matter that Dr. McGlinn has just spoken of I should like to sound a pessimistic note. In 1913 we started the movement to control cancer by education. When I think that seventeen years have elapsed and that our percentage of curability is just about the same as it was in 1913, I think those wonderful dreams that we had at that time are no longer to be entertained. We must realize that in spite of the very excellent methods—and I think under Dr. Howard Taylor's leadership, the United States has done a great deal of educational work not equaled by any other country in the world, and in spite of the most detailed effort to get information to the public and to the profession, we have done very little to increase the percentage of

cures. People still fear to come to the doctor for treatment and all that we do has a relatively small effect in obtaining these cases early.

Prof. Zweifel gets 25 per cent of cures and possibly by intensive educational methods we may raise that to 30 per cent, but do not let us delude ourselves into thinking we can accomplish more in this campaign of education than human frailty will permit.

I should like to emphasize also what Dr. Ward has said about reradiation. It seems to me that has not been stressed as much as it should. In following up our cases at the Barnard Hospital we at times have had occasion to catch recurrences in a very early stage and have been able to prolong and sometimes to save a life by such reradiation.

DR. LILIAN K. P. FARRAR, NEW YORK CITY.—I am glad to speak on the matter of education that has been taken up, but when we talk about operation and radium treatment for cancer in a country as big as this and compare it with one center of a country in Europe we are getting rather a wrong impression and we are not going to lessen the mortality from cancer. If we could have a method of applying radium demonstrated perhaps by the Cancer Control Society throughout the big cities, it might be a very good thing to educate those who would use it in a short time. It is not possible for a man even with Victor Bonney's skill to develop a technic in a complete hysterectomy of the Wertheim type without years of work. Yet it can be demonstrated how to apply radium, how to follow it up, how to give the second, third, and fourth application of radium needles which we do in the Woman's Hospital with good results. It seems to me in that way we really could educate people and lessen the mortality of cancer.

The theory of cleaning up the cervix was done years ago by Schauta by treatment with douches and in that way it was his object to make the uterus sufficiently mobile for operation. That can be done, as well as lessen the absorption that takes place with the application of radium. If in addition to that blood transfusions are given it will be a great benefit. I never apply radium to a patient who has less than 50 per cent hemoglobin and 3,500,000 red cells. If the patient is in better shape before radium is applied the result is a great deal better.

As Dr. Brettauer said, it is a difficult thing to do a hysterectomy after radium has been applied provided it has been applied long enough before so that the connective tissue has developed in the cervix. The time for operation, if one is to do a hysterectomy, is as soon as the slough has disappeared so that the danger of infection is over and connective tissue has not developed.

PROF. ZWEIFEL (closing).—Dr. Ward referred to the methods of irradiation. We always treat patients with radium and x-rays. We do not attempt operation in those cases because of the high mortality, but irradiation is always done. It is a great pity that the results of cancer treatment are not known and realized at once. Therefore, I think it is absolutely necessary that students should be informed about the treatment with x-ray and radium so that they may know when they are practicing physicians whether the treatment has been properly done or not.

Certainly to treat cancer with radium and x-rays is at least as difficult as to perform an operation.

I have given you only the percentage of absolute cures because I think in so many cases it becomes evident only during the operation whether the case is operable or not. It is not of much use to make a comparison between the relative cures for operative cases and radiation cases. The great advantage of the irradiation is that it has no mortality and certainly we shall have better success if the patient would come early in the stages of the disease.

Some statistics from Leipzig in 1921 show that they had taken out all the early cases of cancer which were treated with operation at that time and the

relative percentage of cures was 87 per cent. Of course, this is only for the very early cases coming within about four weeks after the beginning of the symptoms. That shows the very great importance of getting the patients as early as possible, and this is really the only chance to improve the results.

For comparison the results by Heyman are probably the most valuable ones because the clinic in Stockholm since starting radium treatment has nearly always followed the same method of treatment. We have changed our method several times, Regaud as well.

Dr. Ward mentioned that perhaps it is better to give smaller doses of radium and to repeat them oftener and we have found that for the first two years in München when we were giving rather small doses, repeated as a rule after two or three weeks, sometimes even after ten days, we had the best results. At this time we had a little over 20 per cent. Giving the very big doses has not improved our statistics but has made the results worse.

The treatment with high voltage apparatus has been mentioned. We ought not to forget that x-rays are very valuable also for the treatment of cancer. This has been absolutely proved. For instance, if you take the postoperative irradiation of cancer of the breast, this has nearly all been done by x-rays. Taking the statistics of H. Meyer in Bremen, and from the surgical clinic of Kiel, the patients were operated upon by the same men; half of the cases had postoperative treatment with x-rays, and gave about 70 per cent cures, and the other half not receiving postoperative irradiation showed only about thirty-five per cent of cures. The x-rays are certainly a help if properly done. The pelvic transverse measurement is between 6 and 7 cm. and we cannot get a very good effect with radium at more than between 3.5 to 4 cm., and the highest 5 cm. There are still 2 cm. left and all those who have operated know that just at the end we very often find cancerous infiltration.

Dr. Brettauer mentioned the importance of following up the patients, of paying their expenses if necessary as done in Sweden. We try to do as much of that as possible but, of course, the question of expense is a very difficult one. In every country money is spent for a campaign against tuberculosis, so why should it not also be spent for the very important campaign against cancer if we realize that the death rate of cancer is higher than that of tuberculosis?

As Dr. Brettauer said, operation after irradiation is something very different from primary operation alone. I quite believe that. I have not done it myself but we hear of cases of fibroids which had to be operated upon and sometimes they show induration. If the operation is to be performed after preoperative radium treatment, one should not wait longer than two or three weeks. If the operation is performed after the lapse of some months I quite agree with Dr. Brettauer that one may find very great difficulty.

Dr. von Mikulicz mentioned the difference in the classification, dividing the cancer cases into several groups. About four or five years ago I did some work along that line and also, in conjunction with a pathologist, wrote a paper on the subject. I do not think we can yet make this classification with certainty but we have found out that evidently those cases of cancer where there is inflammation in the cancer itself and many mitoses have a better chance of cure.

As to treatment with x-rays, I believe it is very important to choose the proper method and I still believe in the method with smaller fields, 6 to 8 or 8 to 10 cm., but I am very much against the big fields, one from the abdomen and one from the back, because with these big fields not only the cancer and the other organs are irradiated but also the blood stream passing through, and it has been mentioned that the blood cells are very important in the application of irradiation. A satisfactory resistance of the tubal organism is very important as the organism has so built up connective tissue for the growing cancer.

3. **Postsalpingectomy Endometriosis,** by Dr. John A. Sampson, Albany, N. Y. (For original article see page 443, October issue.)

DISCUSSION

DR. EMIL NOVAK, BALTIMORE, MD.—Dr. Sampson's observations indicate that these endometrial inclusions in the uterine cornua are not infrequently found where there has been no amputation of the tube. We know very little as yet about the manner of transition of the endometrium into the tubal mucosa, even under normal conditions. It has long been known that in inflammatory disease one frequently finds islands of mucosa deep in the musculature of the cornua, so that a section through the latter will often show the lumen of the tube apparently split up into many small lobules. This picture was described many years ago by Chiari, especially in connection with tuberculosis, though it is frequently seen in nontuberculous inflammations.

In many of these cases there is definite histologic evidence of the inflammatory nature of the lesion. On the other hand, one not infrequently finds pictures similar to those seen in adenomyoma of the uterus, with islands of typical endometrium in the muscle, and with no evidence of inflammation. It is possible, though not probable, that such islands were really produced by inflammation, and that all trace of the latter has disappeared, as it so often does in endometrial tissue. It seems more likely that such pictures are caused by a noninflammatory downgrowth of endometrium, such as occurs in uterine adenomyoma.

These conditions are exactly similar, it seems to me, to those which Dr. Sampson described in his tubal stumps, so that I think the only question to be decided is as to whether tubal amputation may not increase the incidence of these pictures. It is quite possible that this is true, and yet I do not think that the clinical importance of these changes can be very great, inasmuch as endometriosis about tubal stumps is certainly not very frequently described, even though most of us are now fairly alert to the occurrence of endometriosis generally.

Dr. Sampson differentiates rather sharply a tubal and an endometrial type of inclusion. I think one must be rather careful in attributing any great importance to this, because of the interchangeability of type which is apparently characteristic of müllerian tissue. For example, in endometrial cysts of the ovary one may find perfectly typical uterine mucosa in some portions and perfectly typical tubal mucosa in others. This interchangeability is not surprising to those of us who are inclined to accept the celomic metaplasia theory of endometriosis. After all, the evidence as to either one of the two chief theories is largely circumstantial. Every man must make himself a judge and weigh the circumstances on both sides.

The last picture shown by Dr. Sampson, in which an endometrial hematoma was perched up on top of the uterine cornua, would suggest to me that the endometrium in the tubal stump is probably an extension from the ovarian endometrioma. This would seem natural because of the admittedly great frequency of endometrial cysts of the ovary, and the admitted tendency of endometrium in certain cases to proliferate into adjoining tissues.

DR. EVERETT, BALTIMORE, MD.—Two years ago I had the privilege of hearing Dr. Sampson's first paper on this subject. I remarked at that time that I had seen frequently pictures similar to those shown by Dr. Sampson in sections taken from cases in whom there had been no previous operation. How many such cases I had seen I was unable to say, but now I am prepared to give definite figures.

I have studied 122 cases and of that number 37 or approximately 30 per cent showed this follicular gland-like picture in the uterine cornua. That is a somewhat higher figure than Dr. Sampson gives for his own similar series of cases, but still considerably lower than he found in his postoperative cases.

I have several slides which show the similarity of this type of picture to that found in the postoperative cases. I also found that in ten of the one hundred and twenty-two the interstitial and isthmic portion of the tube was lined not by endosalpinx but by definite endometrium.

I might add that in four of my thirty-seven cases showing the gland-like structure in the uterine cornua the lining of the spaces was endometrium alone. In four others some spaces were lined by endometrium, while others in the same sections were lined by tubal epithelium. In the other twenty-nine the spaces were all lined by tubal epithelium.

DR. OTTO H. SCHWARZ, St. Louis, Mo.—In an experimental study dealing with intestinal anastomoses, a marked overproduction of the mucosa takes place in early healing. In studying scars in the uterus of the guinea pig, following cesarean section, I found this same marked overproduction of the endometrium at the site of the incision. In the lesion that Dr. Sampson described, I feel that this takes place in the tube and uterine cornua, resulting in a picture similar to endometriosis and adenomyosis.

I believe that cauterization of the stumps might lead to less overproduction of epithelium.

DR. SAMPSON (closing).—Tubal stumps were studied by us from one hundred consecutive patients who had a previous salpingectomy or tubal sterilization. Misplaced müllerian mucosa was found in the stumps of eighty of these patients. As bilateral salpingectomy or tubal sterilization had been done in forty-seven, one hundred and forty-seven stumps were studied with one hundred and twelve instances of misplaced müllerian mucosa in and about the stumps. Our controls were studied in the same manner as the stumps. In one hundred uteri removed for various conditions misplaced müllerian mucosa was found in or about the uterine portion of the tubes in thirteen; three of these were bilateral. Therefore two hundred uterine cornua were studied in this group with an incidence of misplaced müllerian mucosa in the cornua of sixteen. In the uteri from fifty patients with gross evidence of pelvic infection misplaced müllerian mucosa was found in the uterine cornua of fourteen. Five of these were bilateral. The incidence of misplaced müllerian mucosa in one hundred uterine cornua from these fifty uteri was nineteen. The comparative statistics show, including those of Dr. Everett, a great increase of endosalpingiosis in the operative cases over the nonoperative ones.

In our studies of uterine cornua we have tried to determine where the uterine mucosa ends and the tubal mucosa begins. It has been extremely difficult in many instances. In some cases histologically typical uterine mucosa will extend almost into the isthmus of the tube. In our controls we were interested in determining the source of the misplaced mucosa. In two cases it occurred from a peritoneal endometriosis; in two others it arose definitely from the mucosa of the uterine cavity; in the remaining it came from the tubal mucosa itself.

For two years we have been using the electric cautery in severing the tubes. We cauterize the end of the interstitial portion of the tube in order to destroy the overactivity on the part of this epithelium. Most of our cases of endosalpingiosis of the tubal stumps were of purely scientific interest. There were four instances of invasion of the ovary by sprouts from the tubal stump with the formation of typical endometrial cysts of the ovary, three of the invasion of the abdominal wall and four of the invasion of the intestine. In addition there were two ectopic pregnancies developing in the tubal stump. I believe this whole subject is of considerable clinical importance and that if salpingectomy is indicated we should do a hysterectomy, except as stated in my paper.

The majority of these cases were operated upon for other conditions than the postoperative endosalpingiosis, six of them for cancer of the uterus. In the majority of

the patients had the uterus been removed at the first operation, the second operation would not have been necessary and the lives of two of the patients might have been spared.

4. **The Roentgen Ray as an Adjunct in Obstetric Diagnosis,** by Dr. Harvey B. Matthews, Brooklyn, N. Y. (For original article, see page 612.)

DISCUSSION

DR. DOUGLAS P. MURPHY, Philadelphia, Pa. (by invitation).—Regarding the possible effect of irradiation upon the fetus, in the recent studies made at the University of Pennsylvania, we have been interested primarily in therapeutic irradiation. It has been conclusively shown that the therapeutic use of irradiation, experimentally and clinically, is likely to be injurious to the fetus. Of some 76 women who received therapeutic pelvic irradiation during pregnancy and went to term, about one-third bore infants which showed arrest of development.

A lack of dosage standardization prevents a satisfactory comparison of the effects of different dosages upon the development of fetuses. In going over case reports from the literature, and from the answers to the questionnaires we sent out about a year ago, we made an attempt to correlate the dosages of irradiation given in different clinics, with the evidence of damage in children irradiated in uteri. It was impossible, however, to correlate them so that any satisfactory comparison could be made. Therefore, we do not know what the minimum dosage is which will injure the fetus. Hence we cannot say what amount of irradiation (diagnostic or therapeutic) during pregnancy is absolutely harmless. In the case of therapeutic irradiation the frequency of damage was found to be in proportion to the amount of irradiation.

We received one very interesting report dealing with diagnostic irradiation given during pregnancy. A patient suffering from urinary symptoms was subjected to two large series of roentgenograms. It was later discovered that she had been several weeks pregnant at the time the roentgenograms were taken. She gave birth at term to a child which was described as "a cross between a Mongolian idiot and a cretin." This is the only case that we know of in which a pregnant woman received roentgenographic radiation early in pregnancy, followed by the birth of a maldeveloped infant. This militates against the use of diagnostic x-ray during pregnancy, especially if we could find many such observations. No doubt many thousands of roentgenograms have been taken during pregnancy, and so far as could be learned there were no reports in the literature up to 1927 which would indicate that such roentgenograms taken during pregnancy were harmful. So that, although we have a record of this one observation to suggest that roentgenographic irradiation resulted in the birth of one unhealthy child, there must be thousands of cases to the contrary. It would seem, therefore, that before we condemn this practice we should secure more evidence either for or against its uses. That evidence is lacking as far as the literature is concerned. It would be interesting if the men who are taking roentgenograms during pregnancy would collect data upon this point. Though we do not know the dose of x-ray which can be safely used, we do know that the earlier in pregnancy irradiation is used, the greater likelihood there is of the fetus being damaged, and the larger amount of irradiation the greater the damage is likely to be, so that in general in the use of the diagnostic x-ray it would seem wise to delay irradiation as long as possible and to use the minimum number of exposures.

This opinion is based upon observations secured during a study of the effect of therapeutic irradiation upon pregnant women. It may be perfectly safe to take

many x-ray pictures during the first weeks of pregnancy. Until we get definite evidence that such amounts of irradiation are harmful I think it is safe to continue the practice. X-ray pictures, if taken as late as the eighteenth week, will probably do no harm. We cannot predict what will happen if roentgenograms are made in the early weeks of pregnancy. Hence when any roentgenograms are required, especially if there is any doubt as to the question of an early pregnancy existing, it would be best to be sure that the patient is not pregnant. This warning may not be necessary, but it is wise to consider it in the light of our general knowledge upon the subject. If diagnostic irradiation is performed later in pregnancy there is little likelihood of any damage resulting.

DR. WILLIAM C. DANFORTH, EVANSTON, ILL.—Dr. Matthews did not refer to any of the methods of x-ray mensuration that have been developed and I am very glad that he did not, because while very interesting from the scientific point of view, they are very deficient in practice.

Dr. Matthews emphasized the importance of taking the pictures from two planes, anteroposteriorly and laterally. We have found that this has helped us considerably.

From the standpoint of practical obstetrics I think there are just a few things that should be emphasized. X-rays are often of great use in determining the position of the child and the presence of abnormalities. Particularly should placenta previa or hydramnion be present I think it is important that an x-ray be taken before determining upon any procedure because the rather frequent incidence of monsters in the presence of these abnormalities might cause a change in the operative program.

I was interested to see that Dr. Matthews has been able to diagnose pregnancy so early. The earliest that we have diagnosed it has been five months.

DR. ALEXANDER M. CAMPBELL, GRAND RAPIDS, MICHIGAN.—I should dislike to practice obstetrics without having access to a well-trained roentgenologist.

I want to report some work that our roentgenologists and my associate, Dr. J. D. Miller, have been doing recently. They have been injecting in about 25 cases small amounts of a solution of strontium iodide into the amniotic sac and have obtained a good outline of the fetal soft parts. They have been able to locate the placenta in the majority of cases. In one instance it was demonstrated that a loop of cord was around the fetal neck. In one instance the sex was determined.

This work is not entirely devoid of danger but no untoward results have been seen in normal cases. It is too early to predicate the practicability of it but it is of extreme academic interest.

DR. FRANCIS C. GOLDSBOROUGH, BUFFALO, N. Y.—The roentgenologist must learn to take pictures that will be of help in making diagnoses. Dr. Matthews should emphasize the fact that a negative picture does not mean anything. I have had several cases where there were twins and the roentgenogram showed nothing. In one case the roentgenologist said the patient was not pregnant and twins were born. In another instance the patient had had two pregnancies, both babies stillborn. In the third I suggested an x-ray and she had a normal delivery. In one the x-ray apparently showed two heads. I agreed with the roentgenologist that it was probably a twin pregnancy. We delivered the patient of one child and did not find the second, but we did find a mass. X-ray the next morning still showed the fetal head. The roentgenologist felt sure that I had missed one child. The one fact I want to bring out is that the shadow of two heads is not sufficient for a diagnosis. In this case we had no spinal column. In looking over the first picture that we had taken in the third pregnancy there was a little overlapping of the

head.   Evidently it was that fibroid which had been calcified and which had evidently been present for a great many years.

DR. FREDERICK J. TAUSSIG, St. Louis, Mo.—I should like to call attention to the very interesting work that has been done by Jungmans in Germany in the very early diagnosis at eight weeks of pregnancy. His technic is such that by the use of a long tube and by placing the camera at right angles to the inlet plane of the pelvis, he can photograph certain objects that he can by experience recognize as fetal bones upon the plate. The interpretation of these plates apparently requires considerable experience; the bones if photographed at right angles will show no shadow, but if photographed lengthwise will show as a dot. These dots and dashes and crescents may be interpreted as fetal bones.

The remarks of Dr. Murphy make one wonder if one is justified in adopting this method of early diagnosis of pregnancy. If there can be any harm done by repeated photographs, and if there have to be rather prolonged exposures to get these little bone shadows out clearly, I think we should adopt other methods such as the diagnosis of pregnancy by the urine and other measures which are surely equally reliable with the x-ray.

In our service at the Barnes Hospital we have two x-ray photographs of abdominal pregnancies and in studying these plates I feel convinced that in a third case of this kind I would be able to make the diagnosis from the x-ray photograph alone because it showed very definitely a shadow of the uterus and the full-term fetus lying outside the limits of this uterine shadow.

DR. JOSEPH L. BAER, Chicago, Ill.—At the Michael Reese Hospital in the early diagnosis of pregnancy we like to use carbon dioxide pneumoperitoneum administered transabdominally. The patient is uptilted, the uterus thus being surrounded by this gaseous background and quite apart from the adjacent viscera so that the diagnosis is rendered a little more easy. The risk is practically *nil*.

In diagnosis of fetal death Dr. Arens has pointed out what Dr. Matthews has emphasized, namely, angulation of the fetal spine. The overlapping of the skull bones is by no means pathognomonic. I have a film showing marked overlapping at term and the baby was born alive.

DR. MATTHEWS (closing).—As to the matter of dosage, I think Dr. Murphy is perfectly right in sounding a warning, but remember he is talking about therapeutic dosage and we are talking about a filming dosage. The dosage we figured as safe for the fetus at any age, we cut in half, to be doubly sure, and hence I feel satisfied that the filming of a pregnancy at the twelfth to the fourteenth week and beyond is perfectly safe. Before this period there is no use filming them without insufflating the peritoneum, because the fetal bones will not cast a shadow. The cases that Dr. Murphy referred to were filmed early, at four, five, and six weeks. Dr. Murphy spoke of a case of Mongolian idiot filmed at the fourth week; such a case need not necessarily have been produced by the x-ray. Furthermore, one case does not prove very much. All that Dr. Murphy said regarding dosage is correct but it does not apply to the filming dosage. The filming dose we recommend is so small that we feel, in our experience in over 300 cases, that it will not do harm to the fetus.

The reading of the plate is very important. Naturally the more experience one has the better he can interpret them. As Dr. Goldsborough mentioned, it is often not the fault of the method but the fault of the men who are trying to execute the method.

Dr. Baer spoke of the overlapping of the bones but he did not specify that the patient was in labor. If she is in labor, and particularly if the head is in the pelvis

and there has been any moulding whatsoever you get overlapping. The history of the case and the proper interpretation of the film would keep one from making an incorrect diagnosis of dead fetus in such an instance.

5. **Fetal Malformations in Multiple Pregnancy,** by Dr. Fred L. Adair, Chicago, Ill. (For original article, see page 539, October issue.)

6. **Music in the Operating Room,** by Dr. John A. McGlinn, Philadelphia, Pa. (For original article see page 678.)

DISCUSSION

DR. JOSEPH B. DeLEE, CHICAGO, ILL.—I have had considerable experience with music as an assistant in local anesthesia. About fifteen years ago when I was converted to the use of local anesthesia for the low cervical cesarean section I used the phonograph to supply music during the operation but the intention was not so much in line with Dr. McGlinn's plan, as to convert the patients to the idea of local anesthesia and to help them see that the operation was practically painless. It did convert a large number of patients.

We found that patients preferred the string quartettes as the most soothing and most generally applicable.

DR. McGLINN (closing).—I think one remark which was just made is very pertinent and that is that the hearing of patients is very acute while being operated upon under spinal anesthesia. I had a colleague who objected to the use of music because he said he preferred the operating room to be quiet and even though he had adopted rubber rings for his sponges, his operating room was a jumble of noises; his assistants and nurses were talking, dozens of instruments were making a noise and there were many other unnecessary noises. External noises are eliminated by the sound of music and the patient is not terrorized by this sound as she often is by other operating room noises.

7. **Obstetric Motion Picture Films,** by Dr. Joseph B. DeLee, Chicago, Illinois.

8. **The Treatment of Salpingitis by Local Injection of Turpentine,** by Dr. Herbert M. Little, Montreal, Canada. (For original article, see page 582, October issue.)

DISCUSSION

DR. ARTHUR H. CURTIS, CHICAGO, ILL.—I wish to emphasize that I continue to be a warm advocate of palliative care of patients with active tubal infection irrespective of the etiology of the infection. If we stop to contrast Dr. Little's method with that of absolute conservation in the management of acute tubal infections I believe we will find that there is not, after all, such a great difference as might appear at first glance. I surmise also that it is highly probable that the needling of the tube, which is relatively simple, may markedly diminish the amount of suffering which the patient may have. If the tubes were easily available so that it would not be necessary to open the abdomen I should be tempted to do that in many instances. I think also the rest in bed incident to recovery from the abdominal wound promotes convalescence from the active infection of the pelvis.

My belief is that the fundamental factor underlying treatment should be that the acutely infected, bacteria-laden, badly diseased pelvic tissues should be left

undisturbed, aside from making an abdominal incision. Dr. Little does this almost as much as we who believe in absolute conservatism in the care of these infections.

DR. SIDNEY A. CHALFANT, PITTSBURGH, PA.—The former treatment of acute inflammations has been largely devoted to limiting the mortality. In recent years there has been a turning to the physiologic end, to try if possible to restore function and this work of Dr. Little's is undoubtedly in that direction. We have occasionally opened an abdomen where we thought the acute condition had more thoroughly subsided than it really had and we have been compelled to close that abdomen rather than to persist with a rather dangerous operation. We have always been impressed with the fact that those patients seemed to make a very rapid recovery after that operation. Their acute condition apparently subsided more promptly than you would expect it to do. Whether opening the abdomen in these cases is a factor or not I do not know but I rather think it is. I have often wondered what became of the milder, not the most severe, acute inflammations in the days before operation? What happened to them? How many of them got well and how many were functionally well? We cannot get statistics on that point now, but I believe that there were many of them who recovered with the absolute conservatism of the time. I am still firmly impressed with the idea of complete conservatism as indicated by Simpson's work and as further carried out by Curtis.

DR. LITTLE (closing).—I might say that as far as acute cases were concerned they were operated upon only when incorrectly diagnosed. Advocacy of the injection in acute cases is for the benefit of the general surgeons, many of whom now do it when they open for a supposed appendix, having found it a perfectly safe thing to remove the pus and inject the tubes with the turpentine in oil.

Dr. Curtis also asked about operation in the acute stage. Most of the cases considered in my paper had had rest treatment for a considerable time and we assumed that the infection was more or less arrested.

Dr. Brettauer asked about the difference in cases of acute streptococcus, staphylococcus and gonorrheal infections. I do not think we have tried it in any cases of acute streptococcus infection except in the one case with ovarian abscess. Practically all were women with external evidence of old gonorrheal infection.

9. **An Histologic Study of the Perivaginal Fascia in the Nullipara,** by Dr. Byron H. Goff, New York, N. Y. (By invitation.) To be published in *Surgery, Gynecology and Obstetrics,* and in the current volume of the Society's Transactions.

10. **Granulosa Cell Tumors of Ovary and Their Relation to Postmenopausal Bleeding,** by Dr. Richard W. TeLinde, Baltimore, Md. (By invitation.) (For original article see October issue, page 552.)

11. **The Early Diagnosis of Adnexal Cancer,** by Dr. Brooke M. Anspach, Philadelphia, Pa. (For original article see October issue, page 571.)

DISCUSSION

DR. JAMES E. KING, BUFFALO, N. Y.—There are three clinical types of carcinoma of the ovary, the metastatic type, the malignant cystic degeneration, and finally the primary tumors, which are acknowledged to be comparatively rare.

A feature of great importance which has never been satisfactorily explained, is that these ovarian malignant growths are practically always bilateral. At the operat-

ing table the question of primary or secondary growth is often difficult to decide. Early stomach and colon growths may give rise to rapid proliferation in the ovaries and with solid tumors of the ovary such a primary focus should be sought. Secondary ovarian growths incidental to carcinoma of the uterine body are much more apt to be recognized as such. The great frequency of bilateral involvement suggests a direct lymphatic connection between the adnexa. The tumors which I have been able to study have never shown any carcinoma cells that suggested that the secondary ovary was involved by lymphatic extension through the uterine wedge. We are justified in concluding, I believe, that the involvement of the second ovary possibly comes from some retroperitoneal connection. What is true of the bilateral involvement is equally true of the tubes. I desire to refer to three cases of carcinoma of the tube which came under my care. Compared with malignant disease of the ovaries, carcinoma of the tubes is rare.

The first case, seen in September, 1922, was a woman 55 years of age, menopause occurred at 48. The April preceding her first visit she noticed a brownish watery discharge which first appeared in large quantity, to reappear as gushes at irregular intervals. On examination, which was difficult because of a fat abdomen, a large mass could be palpated on the right side. At operation a large distended tube of the right side was prolapsed into the culdesac bound by old adhesions. The tube and ovary were freed and removed. The adnexa of the left side were apparently normal except for adhesions of long standing and these were not disturbed. The uterus was small and was not removed. On opening the distended tube a quantity of brownish serous fluid escaped. Beginning about one-half inch from the cornual attachment of the tube the lumen was occupied and distended by a capillary adeno-carcinoma. The real pathology was not suspected until the tube was opened. The patient lived a year and died of peritoneal metastasis.

The second patient was aged fifty-three. She complained of a watery brownish discharge. The uterus was somewhat enlarged. On Sept. 25, 1929, the uterus was curetted and no material obtained. Believing this was an atrophic endometritis, 500 milligram hours of radium were used. The discharge persisted and in November the enlarged uterus and a slightly tender mass could be made out on the right side. On Jan. 27, 1930, a laparotomy was done and on the left side a large adherent cystic tube freed and delivered. The uterus, the size of a large pear, was removed. Both tubes contained fluid and papillary adenocarcinoma. The uterus was markedly distended by a brownish serous fluid similar to that in the left tube. The uterine wall was thinned but nowhere showed grossly or histologically any malignancy. The ovaries were free of growth.

The third case was a woman forty-four years of age who complained of pain in the lower abdomen and a brownish watery discharge. There was a firm irregular tumor occupying the lower abdomen and pelvis. At operation, on the left side a large irregular adherent tumor was freed; on right side a soft tumor closely connected with the uterus was removed. On opening the growth it was found to be a papillary adenocarcinoma of the right tube, the growth having perforated the tubal wall into the broad ligament and by extension was beginning to invade the interstitial portion of the tube. The endometrium showed no involvement. The tumor on the left side was shown to be a cystic papillary adenocarcinoma of the ovary with numerous solid portions showing the same general histologic characteristics as the tube on the right side. Now the question is whether or not the ovary was primarily involved with the tube or whether the tube was secondarily involved with the ovary?

I want to emphasize that in all of these cases of tubal carcinoma the brownish discharge is a very characteristic symptom and when one finds that and the curettage shows that there is no carcinoma of the uterus, carcinoma of the tubes may be strongly suspected.

DR. JENNINGS C. LITZENBERG, MINNEAPOLIS, MINN.—The paper of Dr. TeLinde recalls to our minds the fact that the ovary has always been the battle ground of histology, centering around the histogenesis of several tissues that occur, even in the normal ovary, including the follicle, the corpus luteum, the so-called interstitial gland and the granulosal cells and their function.

Another fact that impressed me was that out of these two papers came important clinical lessons. Now in spite of the fact that the solid tumors of the adnexa constitute only 5 per cent of the tumors, nevertheless we are depressed with the unhappy results in diagnosing and treating the malignant diseases of the adnexa. I have been impressed recently with the relatively large number of cases of post-menopausal bleeding that have not turned out to be cancer of the uterus. Some-times we need a blow in the face to bring something home to our consciousness and the blow that I got was eight consecutive diagnostic curettages done on account of postmenopausal bleeding which grossly were very suspicious of malignancy but were not cancer of the uterus. I told the husband of one of these patients that because of the large amount of curettings and their gross appearance that his wife probably had cancer of the uterus, but when the report came back it was nonmalignant. We can no longer subscribe to the statement that postmenopausal bleeding is always due to cancer. Perhaps the paper of Dr. TeLinde may lead us to the solution of this type of bleeding through further study of persistent follicles and their granulosal cells.

Both of these papers teach us pathological and clinical lessons. The clinical lesson that I get is this: that we should continue to do our diagnostic curettages but when we find they are nonmalignant we must not be satisfied, and here is where the articulation between the two papers comes in. Their observations show that when we find there is no evidence of malignancy, we must then exercise the most meticulous care in making our adnexal diagnosis. I agree with them that we may go as far as to do an exploratory operation to determine the diagnosis. I have little patience with those surgeons who make most of their diagnoses with the scalpel. However, there are cases where our diagnostic limitations are such that we must make a frankly exploratory laparotomy.

Dr. TeLinde has brought out the fact that these granulosal cell tumors are not usually histologically malignant, but he shows that these tumors may be mechanically malignant from a clinical standpoint on account of their possible great size. One of his tumors was a tiny little one which emphasizes that it may be wise in the presence of postmenopausal bleeding to open the abdomen to find even these little tumors. On the other hand, one of his cases was so large that it was regarded as malignant, mechanically at least, from its large size. So, I think we can gather from these papers that the histologic and histogenetic chapter of the ovary has not yet been finished; and clinically that when we find these hyperplastic endometria that are not malignant we must be much more careful in studying these cases from the standpoint of bimanual examination, even, sometimes, going to the extent of exploratory laparotomy.

DR. EMIL NOVAK, BALTIMORE, MD.—I have been especially interested in the frequent occurrence of hyperplasia of the endometrium in these cases of granulosa-cell carcinoma. From a physiologic standpoint it seems to me that their significance is not unimportant, because here we have a tumor made up of one constituent of the ovary, the granulosa-cell, in pure culture, as it were. In association with it we find hyperplasia of the endometrium. This, it seems to me, is excellent support of the belief held by many of us that hyperplasia of the endometrium is due to an excess of follicle stimulus, in the absence of any corpus luteum elements.

No chapter in gynecology needs illumination more than that dealing with ovarian tumors. The difficulty comes chiefly because we cannot apply the histogenetic

method of classification as we can with many other tumors. For that matter, we do not know the histogenesis of any of the tumors of the ovary, except perhaps the simple cysts, which are not genuinely neoplastic.

The granulosal tumors are a relatively small group, but even they differ quite considerably in their histologic structure, as you have seen from Dr. TeLinde's pictures. In grouping ovarian cancers we speak of cystic and solid varieties, but in subdividing these groups we are obliged to do so in a rather clumsy fashion. This applies especially to the solid type, which is subdivided into such varieties as the medullary, the alveolar, the Krukenberg, etc. In other words, special names are given merely because of rather special characteristics.

I believe that we shall find granulosa-cell carcinoma in the future more frequently than we have in the past, now that attention has been called to their existence. I was most interested in the last case reported by Dr. TeLinde. When he showed me sections from this case, I got quite excited about them, because they at once suggested a similarity to those which one may see in the ovary after pituitary implantation. Moreover, they were quite suggestive of the picture in the ovary of one of our cases of chorioepithelioma. Certainly the cells do not suggest malignancy and, in fact, they are rather large and polyhedral. On asking Dr. TeLinde about the history of this patient, he told me that she is very tall and angular, that she has for many years had an extensive growth of hair about the face and elsewhere, and that in short, she is of somewhat acromegaloid type. I wonder if the pituitary cannot be in some way involved in these cases, and whether the study of such cases may not throw some interesting light on the relation of the endocrine glands to neoplasma.

PROF. E. H. ZWEIFEL, MUNICH, GERMANY.—Dr. TeLinde has pointed out the importance of postmenopausal bleeding and the frequency of malignancy in ovarian tumors. In our literature I have found that about one-half of the ovarian tumors after the menopause which cause bleeding are malignant, including the small ones. Neumann, in 1895, showed that out of five hundred cases of postmenopausal diseases coming to the clinic, there were only three with no bleeding in the cases of cancer. That means that practically every cancer case in an old woman causes bleeding. Just the small tumors in the menopause that remain in the pelvis are typically malignant. Generally we teach the students that all growing tumors in the pelvis after the menopause are to be regarded as cancer.

I am very much impressed with the paper of Dr. Anspach on the malignant diseases of the fallopian tubes. There are about 230 cases in the literature and the prognosis is bad. Only one case has been cured; a second one died six years after the operation. These cases were operated upon in a very early stage.

The cancer developing in the fallopian tube, a hollow organ, should give a better chance for cure if the diagnosis was made early. Now the question is, is it possible to make an early diagnosis? There is a chance in about one-third of the cases. Dr. King mentioned the brownish watery discharge. We know that about one-third of the cases of fallopian tube cancers have a yellowish discharge, about the color of amber, and this discharge appears in a typical way about every fortnight or three weeks or more. After the discharge the patients say that they feel better. The discharge usually amounts to several ounces. This is absolutely characteristic for the diagnosis of cancer of the fallopian tubes and if stated in the history it is sufficient to make the diagnosis.

DR. WILLIAM P. HEALY, NEW YORK CITY.—In regard to Dr. TeLinde's report I was particularly interested in the clinical story of his cases. When the granulosal cell tumors seemed not to be malignant there was recurrent periodic menstruation without persistent bleeding after the menopause, whereas, as he mentioned in one

case, with carcinoma the patient had continual and not interval bleeding. I think that is a very important point.

When we come to the question of treatment of the cases, of course, the diagnostic curettage is our first resort when we cannot identify a tumor mass in the adnexa of a woman after the menopause. Assuming that we find a little tissue with the curette, or a great deal, what shall we do about it? Well, based on the report of this paper, since we are dealing with nonmalignant tumor cells in the ovary, I think there is every reason why we should place in the uterus a radium applicator and give the patient a reasonably large dose of radium and also a high voltage x-ray cycle. If there is a malignant tumor this treatment will certainly help protect the patient, and if not, both of the conditions mentioned will respond to radium therapy, both the endometritis and the nonmalignant ovarian lesion. Therefore, I would very definitely suggest the use of irradiation as the form of treatment in these cases where no tumor is palpable, at the time of the diagnostic curettage.

As to Dr. Anspach's paper, we have a totally different situation there and while we all regard ovarian tumors, that we can identify by their size, as a surgical proposition, we do know how frequently we are unable to completely remove the tumor mass. As Dr. Anspach emphasized, it is a quite proper procedure to use very extensive postoperative irradiation in all of these cases. The results are not bad. There are already many cases on record, where very large masses that were not surgically removed have disappeared and failed to return for at least three years since we have been using high voltage therapy.

It is quite unfair to the patients not to give them this treatment. And then we must bear in mind that there are in the ovary, as elsewhere in the body, tumors that are decidedly of the embryonal cell type that will disappear under irradiation therapy and that cannot be cured surgically. We had a case of a young girl, twenty-three years of age, where an exploratory celiotomy was done. They removed only a portion for microscopic study and referred the patient to us. Within six weeks after irradiation was started the entire tumor mass disappeared and it is now two years since irradiation.

DR. ROBERT L. DICKINSON, NEW YORK, N. Y.—As to recurrence, it seems to me that there are two approaches to cancer study that need more emphasis. One is prevention, and the other the study of recurrences in the light of the original disease. Dr. George Gray Ward suggested that a better study be made not only of the original tumors but of the recurrences and I made a study of the matter based on the Paris Institute anatomical diagrams in outline on which they graphically draw, life size, the original tumors and the location, size and progress of recurrences. Now those Paris pictures are badly proportioned. The new ones I have made record the size and location of the original growth, and particularly the location of recurrences. In those records of recurrence on the vaginal wall, why should they appear low down at such odd spots after removal of the cancer of the cervix? I am accustomed to making drawings in clinic and operating room and it is a habit that is bound to grow up to become part of our regular entries. I got the Brooklyn Hospital group so that several could make such diagrams and they have served a great purpose. One does not need to be an artist to chart a tumor on a life-size section of the body.

Another approach to cancer study was brought to my attention forcibly by a follow-up I am doing of about 700 chronic cervicitis cases to see what happens to them. It seems to me that no more important piece of work in the prevention of cancer of the cervix can be done than to drive home to every man who delivers a patient that it is his duty to see that the cervix is left healed after a delivery just as much as to see that a retroversion is replaced. We have the responsibility of retroversion nailed on to the obstetrician by the gynecologist and we can certainly

fasten neglected cervicitis on him. From the study I have made of my cervicitis cases of thirty or forty years, we can produce results in the follow-up of the chronic eroded cervices in prevention of cancer.

DR. FRED L. ADAIR, CHICAGO, ILL.—I have had two cases of tubal carcinoma one of which was undoubtedly primary in the uterine end of the tube. This woman had postmenopausal bleeding and was curetted. We found a small uterus with a slight amount of uterine mucosa, the microscopic examination of which revealed no malignancy. I was unable to palpate the tumor at the first examination but later was able to feel the tube and she was subjected to a laparotomy but the tube was adherent and the growth had extended and involved adjacent structures. She subsequently succumbed in spite of high voltage x-ray therapy.

The other case came in with abdominal malignancy and she was later subjected to autopsy. While the tube was definitely involved it was difficult to say that it was primarily involved.

Another point which I wish to make is in reference to Dr. King's statement concerning the bilateral occurrence of adnexal tumors. I do not wish to refer extensively to the pathology of twins but there have been many cases reported of twins, in which identical affections have occurred about the same period of life.

There have been some duplicate twins with nearly identical tumors. It seems to me that it is not more difficult to explain tumors appearing synchronously in paired organs of the same individual than the occurrence of identical tumors in the entirely separated organs of duplicate twins.

DR. JOHN A. McGLINN, PHILADELPHIA, PA.—The problem of postclimacteric bleeding is not very easy of solution. About six or seven years ago I reported before the Philadelphia Obstetrical Society 2 cases of bleeding which showed the typical hypertrophic endometrium. After the application of 1200 milligram hours of radium they continued to bleed and, fearing we had overlooked some malignancy of the endometrium, the specimens were again studied by myself and by other pathologists and malignancy eliminated. Feeling that the proper thing to do was to remove the uterus, hysterectomy was done in all of these cases, and a very careful search made to see why the bleeding continued even after the application of radium. There was no macroscopic disease of the fundus or ovary and the only histology shown in the uterus was the typical sclerotic changes of the blood vessels which occur after the application of radium. There was no evidence of any malignancy and there have been no recurrences. We are at a loss to explain why they had the postclimacteric bleeding in the first place, and why it continued after the first fairly large dose of radium.

DR. TeLINDE (closing).—About a year ago I had the opportunity of making a careful histologic study of all of the cases of postmenopausal bleeding that occurred in our laboratory and I found, somewhat to my surprise, that in 40 per cent of the cases there was a benign cause. In one case of a woman of eighty-five years who was bleeding profusely I felt that there was almost certainly a carcinoma of the body of the uterus but curettage brought away a single benign endometrial polyp.

There were five cases in which we were unable to explain the cause of the bleeding satisfactorily and inasmuch as one sees in the literature reference now and then to hypertension in postmenopausal bleeding I investigated the blood pressures. The average age was sixty-two, and the average blood pressure was 148, so there was certainly no evidence of hypertension in these cases.

One case of granulosal cell tumor of the ovary reported in the literature occurred in a woman who had previously had radium therapy for uterine bleeding. This indicates to me that if radium is used without satisfactorily explaining the cause on sound pathological grounds, the patient should be carefully followed.

One of the chief advocates of laparotomy in these cases of postmenopausal bleeding without satisfactory explanation of the bleeding in the uterus is Schiffmann. He bases his views on cases which he has followed which originally presented themselves for uterine bleeding. In one of these a vaginal hysterectomy was done leaving the adnexa in situ. Later the patient returned with an inoperable carcinoma of the ovary. The only drawback to laparotomy in most of the cases is the woman's age. The patient should be gone over very carefully medically before performing a laparotomy.

DR. ANSPACH (closing).—Dr. TeLinde has just mentioned Schiffmann's report on the difficulties attending the early diagnosis of cancer of the ovary. The same situation confronts us in cancer of the tube; there are six or seven cases reported in the literature that became inoperable during the course of observation because the symptoms were not appreciated.

I am not in accord with Dr. Healy in regard to the use of irradiation, at least in the doubtful cases, unless the patient has refused operative treatment.

(To be continued in the December issue.)

Department of Book Reviews

Review of New Books

A great deal of credit is due C. C. Norris for writing this book on *Uterine Tumors*[1] for the practitioner. Since uterine myomata are the most frequent tumors occurring within the peritoneal cavity and carcinoma of the cervix is the most frequent malignant newgrowth occurring below the waistline, it is important for general practitioners to know a good deal about these and other lesions of the uterus. The author devotes chapters to cervical polyps, malignant tumors of the cervix, carcinoma of the body of the uterus, myoma uteri, malignant tumors of the body of the uterus, and tumors of the chorion. He especially emphasizes the diagnosis of these conditions and explains the tests necessary for their detection during their early stages. Major operative technic is not discussed but the author points out the most satisfactory forms of treatment for each condition. Radiation therapy is given careful consideration. It is unfortunate that the author has failed to discuss tuberculosis of the uterus which is not a rare condition. Perhaps it was omitted because it is usually secondary to tuberculosis of the fallopian tubes. However, tuberculosis of the cervix is discussed but this is frequently primary.

This book contains so much useful information that it should be carefully studied by general practitioners. However, specialists in gynecology will also profit greatly by reading it.

—*J. P. Greenhill.*

This (*Cancer of the Breast*[2]) is one of the new series of medical monographs. The author stresses the early symptoms of carcinoma of the breast. Various pathologic and clinical classifications of the disease are discussed. The processes in the dissemination of cancer of the breast are dealt with in relation to pathology, operability, and metastases. The author regards a chemical irritation as a factor in the causation of both chronic mastitis and carcinoma of the breast. He states that in breast cancer he has never noted a complete destruction of the tumor cells by roentgen rays. He feels that radium rarely offers a cure. Surgical treatment is fully handled. An excellent résumé of the subject, clearly and concisely written.

—*Philip F. Williams.*

This monograph (*Die Entzündlichen Erkrankungen der Weiblichen Geschlechtsorgane, Ihr Wesen, Ihre Erkennung und Behandlung*[3]), based on twenty years' observation, is a very complete study of the subject. While the effects of the gonococcus occupy the greater part of the book other infections are also discussed. Notable, however, is an absence of any mention of Granuloma inguinale and Trichomonas vaginale.

The author strikes a convincingly conservative note as to treatment in his first sentence and carries the motif throughout the book.

[1]**Uterine Tumors.** By Charles C. Norris. Harper and Bros., New York and London, 1930.

[2]**Cancer of the Breast.** By William Crawford White, M.D., F.A.C.S., New York and London, 1930. Harper & Brothers.

[3]**Die Entzuendlichen Erkrankungen der Weiblichen Geschlechtsorgane, Ihr Wesen, Ihre Erkennung und Behandlung,** von Prof. C. Bucura. Julius Springer, Wien, 1930.

Laboratory studies are described in detail. Local evidences of various infections and infestations are discussed in various chapters. An almost complete absence of illustrations is noteworthy, while a copious and up-to-date bibliography is appended.

—*Philip F. Williams.*

The popularity of this standard textbook for nurses (*Obstetrics for Nurses*[4]) is evidenced by the fact that it has reached nine editions within twenty-six years. It furnishes an excellent text for the education of nurses in the theory of obstetrics, a splendid manual of the technic of home and hospital maternity nursing. Use is made of strips of motion picture films of deliveries. The newborn infant, normal and abnormal, and infant feeding are fully considered. The various appendices and the Glossary thoroughly supplement the purely theoretic matter, making this an excellent manual.

—*Philip F. Williams.*

The most recent of this series of publications (*Methods and Problems of Medical Education*[5]) by the Rockefeller Foundation is devoted to the teaching of anatomy and histology in the medical schools of the world. Representative articles appear from Europe, North and South America, Japan, India, Australia, and New Zealand. A card is enclosed announcing the death of the former Director and Editor, Dr. Richard Mills Pearce, Jr., through whose wisdom and energy this splendid series of monographs had their inception, and whose death marks an irreparable loss to medical education on three continents.

—*Philip F. Williams.*

The report[6] of the Commission on Medical Education and Related Problems in Europe reveals the fact that the obstetric teacher in the United States is not alone in his demand for more teaching hours and more hours of clinical instruction in the problems of obstetrics. Seventy-five per cent of expectant mothers call on midwives for their confinements, and 60 per cent of all deliveries in England and Wales are attended by midwives. Only 22 per cent of the trained midwives actually practice, there are 60,000 names on the midwife roll of Great Britain. This condition hampers the English medical student in his clinical teaching, for the Lying-In hospitals are full of pupil midwives who waste the clinical opportunities. The regulations of the General Medical Council require that each student attend only twenty cases which poorly fits him for his later, mostly abnormal, practice, mainly consisting of cases which the midwife is not permitted to attend. As for Germany the report states that "all students must participate in at least four deliveries. The training in obstetrics for most students is not satisfactory." Nothing is said of instruction in obstetrics in France. In Austria the student must spend 2 periods of five days each on twenty-four-hour duty in the woman's clinic and see all cases delivered. In the Netherlands the student spends six weeks on duty in the Obstetric Wards, in Sweden four months is devoted wholly and entirely to obstetrics. In Denmark a practitioner, to be recognized as an obstetric specialist, must have spent two years in an obstetric department, one of which must be as an assistant, in addition to six months in a department of gynecology as well as three months in a department of venereal diseases. There is no short cut to specialization in Denmark. A full discussion of maternity insurance in various European countries is given.

[4]**Obstetrics for Nurses.** By Joseph B. DeLee, M.D. W. B. Saunders Company, Philadelphia and London, 1930.

[5]**Methods and Problems of Medical Education** (Sixteenth Series). The Rockefeller Foundation, New York, 1930.

[6]**Medical Education and Related Problems in Europe.** Commission on Medical Education, New Haven, Conn., 1930.

The report is replete with details of Medical Education in Europe and a perusal leads one to venture the opinion that European schools are no better fitted for educating medical students in obstetrics than are most American schools.

—*Philip F. Williams.*

A collective presentation of studies (*University of Iowa Studies*[7]), 1927 to 1929, from the University of Iowa covers a wide range of subjects, mostly biochemistry, pharmacology, and clinical pathology. Four articles are of interest to the gynecologist and obstetrician. Dr. Plass's Simplification of Obstetric Care, a plea to eradicate the nonessential and unnecessary; Dr. Williams' Studies in Gonococcus Infection in Female Children, five per cent mercurochrome solution applied to the cervix and vagina through a small urethroscope being found most efficacious; Dr. Miller's Posture Studies in Gynecology, and Dr. Gabler's and Dr. Rosene's acid-base Balance in Pregnancy.

—*Philip F. Williams.*

The well-known *Handbook of Therapy*, written by O. T. Osborne and Morris Fishbein contains almost four times as many pages and almost ten times as much material as the *Formulaire Gynécologique du Praticien*,[8] and yet the former contains only a small fraction of the number of prescriptions to be found in the latter book. The French authors have literally almost filled their book with prescriptions for every conceivable gynecologic ailment. It is true that the title of the book ''Formulaire'' indicates the liberal use of prescriptions, but it is inconceivable that a gynecologist should require so many different drugs. The authors must have prodigious memories or extensive card index systems. In addition to long lists of medication there are also detailed diets for such conditions as cancer of the uterus, salpingo-oophoritis, the menopause, and especially atonic constipation. The authors believe in vaginal, cervical and uterine vaccination for certain acute and chronic conditions. They consider vulvovaginitis of young girls (pp. 47-49) and vaginitis of young girls (pp. 71-73) as separate diseases. Likewise they have distinct sections for pruritus, elephantiasis, esthiomène, kraurosis, and leucoplakia of the vulva but there is no mention of granuloma inguinale. Twenty-six pages containing dozens of prescriptions are devoted to metritis, a condition which in reality is very uncommon.

The reviewer sees no necessity for a book of prescriptions devoted exclusively to gynecology, especially since at least 95 per cent of the prescriptions are either unnecessary, useless, or even harmful.

—*J. P. Greenhill.*

In reality, it is unnecessary to say that Gellhorn's book, *Gynecology for Nurses*,[9] is excellent, because this author always has something useful to say and present in an interesting way. This book, which is written in a style that any nurse can readily understand, is divided into two parts. The first deals with the female genital organs in health and disease and the second with gynecologic nursing. There are twelve chapters in the first part of the book and thirteen in the second part. At the end of each chapter a list of questions is appended as an aid to teachers and students. The final chapter in the book contains a very interesting

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[7]**University of Iowa Studies.** Collected Studies and Reports. Volume III, No. 2. Published by the University, Iowa City, Iowa.

[8]**Formulaire Gynecologique du Practicien.** Par. G. Jeanneney and M. Rosset-Bress and G. Doin et Cie, Paris, 1930.

[9]**Gynecology for Nurses.** By George Gellhorn, W. B. Saunders and Co. Philadelphia and London, 1930.

short history of gynecology. Throughout the book emphasis is placed on proper nursing care. There are abundant illustrations, all of which are instructive.

Undoubtedly this book will become one of the most popular books for nurses.

—*J. P. Greenhill.*

The author of this book[10] probably has done more than any other pediatrician of today to make the feeding of infants a simple affair. The chaotic conditions existing fifteen or twenty years ago have now disappeared. The feeding of normal infants has ceased to be a difficult problem for the pediatrician. The author for the first time publishes his views on infant nutrition in book form and gives also a very complete summary of the work of other writers in this field. For the obstetrician it will be of particular value to read the chapters on breast feeding and on prematurity. Interesting in the latter chapter is the method of feeding premature infants on protein milk combined with buffered lactic acid solution. The results of this method seem to be very encouraging. The chapter on anhydremia, alkalosis, and acidosis is excellent. This book seems to be the best work published on the subject in the English language.

—*P. J. Zentay.*

This[11] is a compendium of pediatrics which attempts to cover the whole field. As so often happens with compendia, its value is limited and will prove of use only to a busy practitioner who has no time to read more voluminous books on the subject. The book gives a short review of the diseases of the newly born and of infant feeding that will be of some interest to obstetricians.

—*P. J. Zentay.*

The first half of the sixth volume of Stoeckel's *Handbuch der Gynäkologie*,[12] third edition of Veit's Handbuch, contains no less than 1167 pages.

Otto von Franqué describes the anatomy, histogenesis and anatomical diagnosis of uterine carcinoma in 210 pages. He insists on a division into portio, external os, and canalicular origin besides that of the body and corpus. He believes that "different biologic properties" produce endo- and exophytic (that is, surface) extension. He likewise considers portio carcinoma more frequent than authors describe. Three such cases are given in detail. All agree with him that carcinoma of the transition zone, that is, where squamous and cylindrical epithelium meet, are most frequent; whether erosions, eversions, and cervical tears, as he postulates, are really causative, has never been fully decided.

The histologic subdivisions used are now almost universally accepted. Squamous cell cancers, he divides into ripe, middle ripe, and unripe types. Exception may be taken to his statement that basal cell carcinoma does not occur in the uterus. The cylindrical types of cancer he likewise divides into ripe (adenoma malignum), middle ripe (adenocarcinoma), unripe (carcinoma simplex). The histology of each of these types is minutely gone into. Von Franqué, in my opinion, juggles somewhat with the term "precancerous" which, after all, serves little purpose in anything except clinical medicine and which has been too frequently misused.

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[10]**Infant Nutrition.** By W. McKim Marriott. Professor of Pediatrics, Washington University School of Medicine, etc., etc. The C. V. Mosby Company, St. Louis, 1930.

[11]**Recent Advances in Diseases of Children.** By Wilford J. Pearson and W. G. Wyllie. Second edition. With 20 plates and 34 text figures. P. Blakiston's Son & Co., Inc., Philadelphia, 1930.

[12]**Handbuch der Gynaekologie.** Dritte, völlig neubearbeitete und erweiterte Auflage des Handbuches der Gynäkologie von J. Veit. Herausgegeben von Dr. W. Stoeckel. Sechster Band, Erste Hälfte. J. F. Bergmann, München, 1930.

Robert Meyer, in the course of the next 630 pages, deals with the pathology of connective tissue and mixed tumors of the uterus.

In connection with myoma uteri, a complete atlas of histology can be found but nothing new has developed. In the etiology he believes that the study of Constitution will help. References will be found in the text leading to the 99 myomas of the portio, which are on record. The details of all varieties of myomas are given. Variations, degeneration, histology are recorded at great length. Meyer considers no hormonal stimulus necessary. The ablation of the ovaries produces atrophy of the uterus and the uterine vessels which consequently affect the fibroids by merely secondarily affecting their nutrition.

Fibroma of the uterus is extremely rare, as are angiomas and lymphangiomas.

More than 300 pages are devoted to adenomyosis and endometriosis in all locations. All the theories, both abandoned and current, are discussed.

Finally he describes sarcoma of the uterus and also mixed tumors.

H. Hinselmann discusses the etiology, symptoms, and treatment of uterine carcinoma. The statistical phases are thoroughly dealt with. He lauds Schiller's colposcopy. His chapter is short, concise, and informative, but contains nothing new.

Robert Meyer then takes up the pathology of hydatid mole and chorionepithelioma. In his discussion he emphasizes the hormonal factors, quoting the well-known cases of de Snoo. In this patient all the hormonal findings of pregnancy were noted, although complete hysterectomy had been performed for chorionepithelioma of the fallopian tube, and in her the sole cause for the presence of a large amount of female sex hormone could be ascribed to the trophoblastic metastases. The relation between lutein cystic ovaries and hypophysis are emphasized.

Hinselmann has the concluding chapter on the etiology, symptomology, and diagnosis of chorionepithelioma.

This volume should be in the library of every gynecologist.

—*Robert T. Frank.*

Volume IV of the *Ergebnisse der medizinischen Strahlenforschung*[13] has appeared. It contains much of interest to the gynecologist. Of especial importance in our field is the chapter by W. Lahm on the biologic basis of the healing of carcinoma. He emphasizes that carcinoma must be looked at both as a local and a general systemic disease. Cancer tissue contains no toxic substances; however, the greatly increased metabolism of the cancerous area can produce symptoms. He is a firm believer in a local predisposition as well as a general systemic disturbance. Radiotherapy produces local cytolysis as well as a re-establishment of local refractory condition.

H. R. Schmidt takes up the question of the histology of cancer of the uterus in relation to radiotherapy. He emphasizes that adenocarcinoma can be cured and that like squamous cancer, the more anoplastic the tumor is, the more radio sensitiveness is noted. He accepts a malignancy index, using that of Schmitz; if above 31, the prognosis is very poor. In an index of 10 to 20, 60 per cent of cures have been noted; 21 to 25, 40 per cent of cures; 26 to 30, 25 per cent of cures.

K. Scheele deals with the radiography of the upper urinary tract, with especial reference to its aid in the diagnosis of abdominal tumors. The technics employed include pyelography, perirenal pneumography and pneumoperitoneum. Diagnosis by means of uroselectan has not yet been included in the discussion.

[13]**Ergebnisse der medizinischen Strahlenforschung (Roentgendiagnostik, Roentgen-, Radium- und Lichttherapie).** Herausgegeben von H. Holfelder, Frankfurt am Main.; H. Holthusen, Hamburg; O. Jüngling, Stuttgart; H. Martius, Gottingen; H. R. Schinz, Zürich. Band IV. Verlag von Georg Thieme, Leipzig, 1930.

A. Adam discusses ultraviolet light and Vitamin D, especially in connection with rachitis. Among the subjects are the sources of the absorption of the rays, effect on the basal metabolism, researches on Vitamin D, and the clinical findings based on these investigations.

P. Keller deals with the protective action of pigment against light. L. Schall describes light erythema including the sources, the reaction of the skin, and the individual variations. M. Lüdin describes the changes in form and position of the stomach due to extragastric lesions.

H. Meyer and W. Schmidt describe "the operative stomach" that is, the x-ray changes noted after various gastric operations, the various operations being dealt with in detail.

E. Lüdecke discusses diathermy in its application to neck and nose diseases, as well as to otology.

From this review it can readily be noted that this volume is of great importance and value.

—*Robert T. Frank.*

Item

American Board of Obstetrics and Gynecology, Inc.

The American Board of Obstetrics and Gynecology, composed of nine members and examiners elected by the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons, the American Gynecological Society, and the Section on Obstetrics, Gynecology, and Abdominal Surgery of the American Medical Association, was formally organized in Niagara Falls, September 16, 1930. The Board will grant certificates indicating proficiency and specialization in obstetrics or gynecology, or both, to those who comply with its requirements.

The Board is now prepared to receive applications from experienced and qualified obstetricians and gynecologists.

This Board has been in the process of organization since 1927. It is hoped and expected that its Certificate will have considerable weight in the minds of hospital trustees and other laymen as well as in many important medical circles whenever a question arises as to an individual's special ability in obstetrics and gynecology.

Detailed information and application blanks may be secured from Dr. Paul Titus, Secretary, 1015 Highland Building, Pittsburgh, Penna.

Department of Reviews and Abstracts

Selected Abstracts

Ectopic Pregnancy

Garfunkel, P.: Extrauterine Pregnancy, in the Gynecological Clinic of the State Hospital in Rostow. Monatschr. f. Geburtsh. u. Gynäk. **77:** 233, 1927.

From 1911 to 1923 the average incidence of ectopic pregnancy among all the hospital cases was 2.6 per cent. During the last sixteen years 176 cases of extrauterine pregnancy were observed in the Rostow clinic and in the majority of cases the etiology was a previous inflammation which produced changes in the tubes and in the neighboring tissues. Because of this, the author advises inspection of the opposite tube during all operations for ectopic pregnancy. If the nongravid tube appears diseased it should be removed or repaired in such a way that a pregnancy cannot occur in it. In all doubtful cases of extrauterine pregnancy, a pelvic puncture should be performed. If blood is obtained, an operation should follow within twenty-four hours to prevent the possibility of an infection. Regularity in the menses does not disprove the presence of an ectopic gestation.

J. P. GREENHILL.

Möller, F.: Symptomatology and Diagnosis of Extrauterine Pregnancy. Acta obst. et gynec. Scandinav. **6:** 279, 1927.

Möller reviewed 190 cases of ectopic pregnancy and found that the average age, as compared with that of intrauterine pregnancies, was high, namely, from 30 to 35 years. The largest number of extrauterine pregnancies occurred in the secundiparas. Amenorrhea occurred in only 56.3 per cent of the cases and external bleeding in 91 per cent. The nature of this bleeding, however, often makes it difficult to differentiate it from menstruation. Abdominal pain occurred in 93.7 per cent and in 16.8 per cent of these patients it was not acute. In most cases the pain occurred before the hemorrhage. The acute pain occurred mostly in the cases of rupture, but also to a large extent in the cases of tubal abortion. Only 44.2 per cent of the patients showed symptoms of collapse. Of 166 cases where the temperature was known, it was subfebrile in 56 per cent. The most reliable information was afforded by bimanual palpation.

J. P. GREENHILL.

Beckers: Diagnosis, Pathology and Frequency of Extrauterine Pregnancy. Progrés méd. No. 28, page 944, 1928.

Menstrual disturbances, abdominal pain, and tumor formation at one side of the uterus constitute the triad of symptoms on which the diagnosis of extrauterine pregnancy may be made. However, the differential diagnosis between this condition and a cornual pregnancy or pregnancy in one horn of a bicornuate uterus is often

difficult. In the former condition the tumor is often apt to be behind the uterus. Again in some cases it is possible to palpate the round ligament which in ectopic pregnancy will be found in front of the enlarged tube. However, neither of these methods of differential diagnosis is satisfactory. Beckers points out that the cornual or bircornuate pregnancy being within the uterus is covered by a definite muscle layer whereas in the tubal pregnancy because of the deficiency of the muscular layer of the tube this muscular coating is negligible. For this reason the consistency of a tubal pregnancy will always be soft while consecutive examinations in a cornual pregnancy will sometimes give a soft tumor and a day or two later a hard tumor due to the muscular contraction of the uterus.

Again, where the tubal pregnancy has undergone rupture, aside from the classical symptoms of shock, severe pain, hemorrhage, etc., Beckers describes a generalized pain often referred to the thorax, sternum or interscapular regions. This pain he attributes to peritoneal irritation by the blood.

The causes of tubal obstruction are innumerable. An interesting case where accessory adrenal glands located in the broad ligament was the cause of the tubal compression is cited. Probably, because of the greater frequency of salpingitis, this condition results more frequently in extrauterine pregnancy than any other.

The claim that the frequency of extrauterine pregnancy is increasing is probably due to the more exact methods of diagnosis than to any actual increase in the disease. It is impossible to arrive at any definite reliable figures as to its frequency because of the fact that undoubtedly so many cases of tubal abortion with spontaneous cure occur.

THEODORE W. ADAMS.

Iwata, M.: The Morphology of the Human Fallopian Tube. Monatschr. f. Geburtsh. u. Gynäk. 81: 283, 1929.

The epithelium of the fallopian tube consists of a single layer of both ciliated and nonciliated cells. The latter cells have a secretory function. Some individuals believe that during menstruation there is not only uterine bleeding but also tubal. This is not a universal opinion, however, but all are agreed that during menstruation, histologic changes take place in the tubal epithelium. The author examined 38 tubes which were removed at different intervals in the menstrual cycle and he found at the ampullary end distinct cyclic changes between two menstrual periods. These changes manifested themselves as alterations in the form of the epithelial cells and in the appearance of a secretion. Although the amount of glycogen in the tube is far less than in the uterus it was most abundant in the tube during the premenstrual period and was entirely absent during menstruation and immediately after the menses. No changes in the muscle wall were observed but there was an increase in the mast-cells in the muscular layer chiefly before and during the menstrual flow. The author was also able to determine definite menstruation and pregnancy sclerosis in the blood vessels of the tube such as exists in the uterus and ovaries.

J. P. GREENHILL.

Klein, S. M.: The Value of the Amidopyridine Test for the Detection of Internal Hemorrhage in the Diagnosis of Ruptured Tubal Pregnancy. Arch. f. Gynäk. 135: 256, 1928.

In 1918, Thevenon and Rolland devised the amidopyridine test for the detection of internal hemorrhage. The test is a very simple one and can be done at the bedside. Eight drops of 50 per cent acetic acid and eight drops of 5 per cent alcoholic solution of amidopyridine and five drops of hydrogen peroxide are mixed together.

To this mixture, five cubic centimeters of urine are added and the presence of even the most minute quantities of blood will produce a violet color in less than fifteen minutes. If no blood is present the mixture remains colorless.

Klein tried this test in 68 patients suffering from gynecologic diseases and during normal menses. In ovarian apoplexy and during normal menstruation, the test was 100 per cent positive. In ruptured ectopic pregnancy it was positive in 90 per cent. In all other gynecologic conditions the test was negative.

RALPH A. REIS.

Moritz, Alan R., and Douglass, Marion: A Study of Uterine and Tubal Decidual Reaction in Tubal Pregnancy. Surg. Gynec. Obst. 47: 785, 1928.

Uterine decidua was found in only 8 of 53 cases of proved tubal pregnancy in which histologic examination of the endometrium was made. In cases of tubal pregnancy (a) uterine decidua may be, but is not constantly, formed; (b) decidua is constantly found at the implantation site, if the chorionic villi are intact. Vaginal bleeding is a common symptom of ectopic pregnancy and is not necessarily associated with the death of the fetus.

WM. C. HENSKE.

Roth, H.: Abdominal Hemorrhage of Ovarian Origin. Gynéc. et Obst. 16: 464, 1927.

The rupture of a follicle may occasionally be the basis of intraperitoneal hemorrhage which will simulate closely that of ruptured ectopic pregnancy. Hemorrhages of ovarian origin should be considered as primary, due to constitutional or blood diseases, infections, etc., and secondary, developing as a result of affections of the ovary itself, such as tumors, inflammation, twisted pedicle, etc. Follicular hemorrhage may occur from either atretic or ovulating follicles or from the corpus luteum. Variations in the intraperitoneal pressure, especially where it is negative, may account for bleeding from fragile surfaces. If one considers how easily bleeding can be provoked by aspiration in the nonparenchymatous organs (buccal mucosa, etc.), such a mechanism is more comprehensible. The menstrual cycle, which affects the vascularization of the entire pelvis and occasionally accounts for vicarious bleeding, may underly a tendency to ovarian bleeding.

A differential diagnosis between appendicitis and bleeding from corpus luteum may be very important but should not ordinarily be difficult. A needle per vaginam may elucidate the diagnosis.

GOODRICH C. SCHAUFFLER.

Wilson, R. K.: Ovarian Hemorrhage Simulating Acute Appendicitis. A Series of Seven Cases. Lancet 1: 1221, 1928.

The writer doubts the possibility of a positive diagnosis being made of this condition. The sudden onset of pain, tenderness on pressure in the right iliac fossa, and an elevated pulse rate, suggest appendicitis. Ectopic pregnancy and salpingitis are not so likely to be diagnosed. Of the cases reported, he adds, the correct diagnosis was not made in any.

No consistent etiologic factor has been found. Trauma was present most frequently. Two clinical types are discussed. The first comprises the milder degrees, giving signs of peritoneal irritation and indistinguishable from acute appendicitis. The second group is fulminating and presents the picture of severe intraperitoneal hemorrhage.

Because the end-result may be fatal, operation is recommended for both groups.

H. C. HESSELTINE.

Simon, L.: Spontaneous Ovarian Hemorrhage with Acute Abdominal Symptoms. Acta obst. et gynec. Scandinav. 8: Supplement, 1928.

A study of the author's 14 cases and 81 cases in the literature have convinced him that extensive intraperitoneal ovarian hemorrhage can occur without the simultaneous presence of pregnancy. The symptoms produced by such hemorrhages may resemble those of appendicitis or extrauterine pregnancy. The ovaries which are the seat of the hemorrhage have a characteristic anatomic structure. The cause of the bleeding is some disturbance in the function of the ovary, especially the emptying of the follicles. An increased amount of connective tissue, experimentally produced in the tunica albuginea of the ovary of rabbits may result in nonrupture of the follicles at the time of ovulation, hence the ova are retained instead of being cast off. The follicles become cystic and atretic, and form cystic corpora lutea. Bleeding then occurs in these cysts. Most of these changes are found to be characteristic of the bleeding ovaries of women.

These cases of ovarian hemorrhage take place in women from thirteen to forty-five years of age and occur in virgins as well as multiparas. The menstrual periods are usually regular. The symptoms are usually acute and begin in the third and fourth quarter of the menstrual cycle. There is almost never any vaginal bleeding.

J. P. GREENHILL.

Corlette, C. E.: Dangerous Hemorrhage from Corpus Luteum in an Apparently Normal Ovary. Med. J. Australia 1: 15, 1928.

The author reports a case of intra-abdominal hemorrhage in an apparently normal unmarried individual at the age of thirty-eight. The last normal period was 29 days before the onset of the symptoms. The symptoms began with a sudden pain referred to the rectum which later spread to the entire abdomen and right shoulder region. The clinical picture was typical of shock from intra-abdominal hemorrhage.

At the operation, which was performed immediately, 1200 c.c. of blood was removed. All of the abdominal and pelvic viscera were normal and free from evidence of bleeding excepting that some dark blood could be expressed through a small aperture in the right ovary. The convalescence was uneventful.

The writer concludes by stating that in all probabilities the hemorrhage was from a corpus luteum in a normal ovary, even though it was near a menstrual period.

H. C. HESSELTINE.

Sellheim, H.: The Treatment of Tubal Pregnancy With Retention of the Tube. Med. Klin. 24: 1736, 1928.

The treatment of ectopic pregnancy has gradually become more and more conservative. Previously the ovary was always removed with the tube but during the last few years the tube alone has been removed. The author now advocates saving the affected tube in cases where subsequent pregnancies are highly desirable. He outlines and illustrates two procedures whereby conservative surgery may be employed to save a tube which is the seat of a pregnancy. In the first operation, after removal of the product of conception, the wound is closed over a sound by means of interrupted oblique and vertical sutures. In the second operation, after removing the ovum, the tube is incised from the fimbriated end to the site of the pregnancy, the excessive amount of hypertrophic tubal tissue is removed and the lumen is then closed with interrupted vertical sutures over a probe.

J. P. GREENHILL.

Hasselblatt, R.: Repeated Pregnancy in the Same Tube. Report of Two Cases.
Acta obst. et gynec. Scandinav. 6: 211, 1927.

The author reports two new cases of recurrent tubal pregnancy on the same side. In one of them an incomplete salpingectomy had been done at the first operation and only the middle third of the tube had been removed. After having passed through a spontaneous labor following this operation the patient was again operated upon for tubal pregnancy on the same side. The pregnancy was found in the remaining lateral part of the tube and the whole tube was removed.

The second patient was operated upon for tubal rupture and in this case also, an incomplete salpingectomy was performed. Only the proximal portion of the tube, 3 cm. long, was left. Two and a half years later a pregnancy developed in this tubal stump and at operation the whole tube was removed.

Such recurrences of tubal pregnancy on the same side occur very rarely. In addition to his own two cases, the author collected nineteen cases, three of which had not previously been published as cases of recurrent tubal pregnancy. The occurrence of tubal pregnancies in the same patient three times has been noted only twice. The recurrence of tubal pregnancies in the same tube is due to faulty operative technic and to a disturbed process of healing. It is essential, in the author's opinion, always to do a complete salpingectomy with a wedge-shaped excision of the uterine cornua and to cover carefully the wound with peritoneum.

The author also critically examined twenty-three cases published as recurrent tubal pregnancy on the same side, but he does not consider them authentic on account of unsatisfactory proof or insufficient data. He emphasizes that the diagnosis of recurrent tubal pregnancy in the same tube can be made only where operation has established absolute proof of the gravid state or where, at least, an operation in a subsequent pregnancy or subsequent postmortem examination makes the connection between the two pregnancies clear in every detail.

J. P. GREENHILL.

Schockaert: A Case of Bilateral Tubal Pregnancy. Bruxelles med. 8: 833, 1928.

Cheval was able to find but sixteen authentic cases of bilateral tubal pregnancy existing in literature. To this number Schockaert adds the case of a woman who had skipped two menstrual periods, at which time she had a painless bloody discharge for nine days. Two days later she developed a severe pain in the lower abdomen, which lasted but a few hours. A month later the pain returned, and a diagnosis of ruptured ectopic pregnancy was made. On opening the abdomen, which was filled with liquid blood and old clots Schockaert found that the left tube had ruptured. The right tube was the seat of a spherical nut-sized mass which ruptured spontaneously while the clots were being removed from the culdesac. Both tubes and one ovary were removed and subsequent microscopic examination showed that each tube was the seat of an extrauterine pregnancy. The author calls attention to the fact that following the death of the first fetus the uterine bleeding did not continue as usual and feels that the uterine mucosa was probably prevented from being cast off by the progressing pregnancy in the unruptured tube.

THEODORE W. ADAMS.

Jordan, H. E., and Meade, R. H.: A Case of Twin Tubal Pregnancy. Virginia
Med. Monthly 55: 605, 1928.

In literature there are only forty cases of twin pregnancy occurring in the tube. In the case reported the twin pregnancy was in the right tube and estimated gestation of measurement would make the time between thirty and thirty-six days.

Clinically the pregnancy was seven weeks and this would check with the histology of the chorionic villi. The smaller embryo seemed to be somewhat stunted in development. The patient had suffered for at least two years with chronic appendicitis and this raises the question as to whether the right tube were not affected so that the ova met definite impediment in their descent through the tube to the uterus.

A. C. WILLIAMSON.

Parker, E. C.: Ectopic Pregnancy. New Orleans Med. & Surg. J. 82: 89, 1929.

The author presents 2 unusual cases. The first was a triple pregnancy in a para ii, twenty-nine years of age. The symptoms consisted in missed period followed by bleeding and sudden severe pain. At operation a ruptured ectopic on the right side, and an unruptured ectopic on the left was found. The tubes were removed. On the fifth day after operation the patient also aborted a six weeks' fetus. Recovery was normal. The second patient was twenty-seven and nulliparous. Three years after having had a ruptured ectopic on the right side which was removed, she had another on the left. No pregnancies intervened between these ectopics.

FRANK SPEILMAN.

Liepmann, W.: Ectopic Pregnancy after a Supravaginal Amputation of the Uterus. Zentralbl. f. Gynäk. 51: 2479, 1927.

Supravaginal amputation of the uterus had been done on account of an intraligamentous cystadenoma, developing retroperitoneally and closely attached to the uterus. For two years the patient remained perfectly well, menstruation had ceased, when severe pains in the lower abdomen forced her to consult a physician, who felt a tumor of grapefruit size directly above the cervical stump. The diagnosis of a fibroid developing out of the stump was made. Another physician believed the tumor to be a hematoma. Finally the culdesac was punctured and blood found. At the hospital the culdesac was opened and drained (instead of opening the abdomen from above). Transfusions, etc., were of no avail, the patient died soon after. Autopsy revealed 2 to 3 quarts of blood in the abdominal cavity and a tubal pregnancy in the right tube. The rupture had occurred at the lowest pole of the tumor, the fetus was 1 to 2 cm. long.

GROVER LIESE.

Keevill, A. J.: Full-time Abdominal Pregnancy, Prolonged Suppuration: Recovery. British M. J. May 12, 1928, p. 801.

In August, 1927, an African woman, about twenty-five years old was brought to the author with the following history: About August, 1924, the patient became pregnant for the first time. In April, 1925, she had labor pains which lasted a day or two but "nothing was born." She was left with a hard swelling in the abdomen. The swelling caused very little inconvenience until August, 1926, when it became very painful, increased in size, and finally ruptured in the region of the umbilicus, discharging a quantity of foul-smelling pus. About the same time the patient noticed small fragments of bone and short pieces of hair.

Examination.—Extremely emaciated, unable to stand erect because of a large, hard, and rounded swelling in the middle of the abdomen. The swelling was discharging thin pus through a small opening about 1 cm. above the umbilicus. Pulse 120. Evening temperature 100° F.

Operation.—Incision was made in the midline. A fold of peritoneum was accidentally opened for about 1 cm. This was swabbed with acriflavine and closed. The cavity contained the fetal remains of an apparently full-time fetus. The cranial and several limb bones were lying loose. The brain had liquefied but the greater part of the soft parts were still recognizable. The cavity passed downward toward the left iliac fossa, and apparently opened into the pelvic colon. The cavity was emptied, irrigated with warm saline, swabbed out with acriflavine, and drained through a large rubber tube. On the second day a fecal fistula formed and discharged fecal matter for fourteen days. The patient improved and made a complete recovery.

ADAIR-LYNDE.

Frolov: Full-term Extrauterine Pregnancy with Living Child. J. akush. i. Zhensk. boliez. 39: 448, 1928.

The author was able to find in literature only 23 reports of full-term ectopic pregnancies with delivery of living babies by means of laparotomy. His patient was thirty years old, mother of 5 living children. She entered the hospital with cramping pains, about eight months after her last menstruation. A living female child, weighing 2,250 grams, was found lying between the intestines. Left adnexa were normal, uterus was freely movable, right ovary could not be discovered. There were no traces of an amniotic sac. The placenta was attached to intestines and omentum. Abdomen was completely closed.

ALEXANDER GABRIELIANZ.

Tschertok, R.: The Increase in the Incidence of Extrauterine Pregnancy and Its Relationship to Its Etiology. Monatschr. f. Geburtsh. u. Gynäk. 85: 19, 1930.

The author reviews the records of 178 cases of extrauterine pregnancy which were observed in the Kiew clinic during the years 1884-1928. Five of the patients had repeated ectopic pregnancies. During the last few years in Russia as elsewhere there has been an increase in the number of tubal pregnancies. In 23 per cent of the present series the patients had previously had attacks of salpingitis and 45.5 per cent of the patients had had miscarriages of which 17.4 per cent had been uncomplicated abortions. The chief cause of tubal pregnancy according to the author is some alteration in the fallopian tubes. The chief factor is inflammation, and during the last few years there has been a decided increase in the incidence of tubal inflammation.

J. P. GREENHILL.

Correspondence

To the Editor:

A recent number of the JOURNAL presented a description of extension teaching in obstetrics by Dr. E. D. Plass. Perhaps the following might be of interest along the same line.

An active teaching experience for the past twenty years has convinced me that any permanent improvement in the mortality and morbidity of obstetrics in this country must come from the inside, that is, the doctors must be trained to do better obstetrics than is being done at the present time. I believe this is a direct responsibility of the medical schools.

I was a member of the Advisory Committee of the Children's Bureau of the Department of Labor during the administration of the Maternity and Infancy Act when the method of extension teaching as outlined below was discussed and approved by this committee. The funds for this work were provided by the Sheppard-Towner Appropriation up to July 1, 1929. The work has seemed so successful that Miss Grace Abbott, Chief of the Bureau, was unwilling for it to be discontinued and, at the present time, it is being regularly continued under an appropriation direct from the Children's Bureau.

The plan of procedure is as follows: The work in Georgia was done under the auspices of the State Department of Health with the Children's Bureau cooperating. All contacts were made and publicity gained through the State Health Department. The approval of the President of the State Medical Association of Georgia was obtained. The proposition was put up to each District Medical Society in Georgia, and to each County Medical Society in Florida.

A typical course of instruction is as follows:

Monday—2-5 P.M. The fundamental principles of the mechanism and management of normal labor and the puerperium.

Tuesday—2-5 P.M. Hyperemesis gravidarum; pre-eclamptic toxemia; eclampsia, and chronic nephritis complicating pregnancy.

Wednesday—2-5 P.M. Puerperal sepsis.

Thursday—2-5 P.M. The management of occiput posterior positions; breech presentation; version, and forceps.

Friday—2-5 P.M. Management of abortions; accidental separation of the normally situated placenta, and placenta previa.

The work is abundantly illustrated by lantern slides, moving pictures, and in some places, by mannikin demonstrations. No hobbies are ridden; only the simple fundamental facts of conservative obstetrics are taught.

The work is absolutely free to the doctors and there is no expense of any kind to the community in which the work is held. Eighteen such courses have been held in Georgia. Colored physicians are invited and one special school was held for colored physicians alone. Up until the present time we have held eight such schools in Florida with about twelve more to follow.

The results are encouraging and I am glad to continue the work even at the expense of a private practice, believing that this is the way to lower more quickly maternal morbidity and mortality.

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